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September 2007
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PRODUCT DEVELOPMENT TRENDS & TECHNOLOGIES FOR FORMULATORS & MARKETERS

Energy Reserves

PF's Exclusive R&D Survey Examines Energizing Ingredient Trends

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Editorial and Sales Offices
1050 IL Route 83, Suite 200
Bensenville, Illinois 60106-1048
Phone: 630-694-4345 Fax: 630-227-0527

Group Publisher Peter Havens
630-694-4345 havensp@bnpmedia.com

Editorial pfeditors@bnpmedia.com
Chief Editor **Claudia Dziuk O'Donnell** 630-694-4344
Managing Editor **Julia M. Gallo-Torres** 630-694-4343
Business Editor **William A. Roberts, Jr.** 630-694-4348
R&D Applications Editor **Kerry Hughes** RDAppManager@gmail.com
Associate Editor **Barbara T. Nessinger** nessinger@sbcglobal.net
Director, Mintel, **Lynn Dornblaser**

Production & Art
Production Manager **Nann Barkiewicz**
248-244-6431 barkiewiczn@bnpmedia.com
Art Director **Karla Fierimonte** fierimontek@bnpmedia.com

Sales
Director of Business Development
Michael Leonard 630-694-4024 leonardm@bnpmedia.com

Midwest-Southeast Sales
Greg Szatko 630-694-4337 szatkog@bnpmedia.com

East Coast & European Sales
Ray Ginsberg 856-802-1343 ginsbergr@bnpmedia.com

West Coast-Southwest Sales
Wayne Wiggins 415-387-7784 wwiggins@wigginscompany.com

Marketing
Marketing Coordinator **Jenny Bogdajewicz**
bogdajewiczj@bnpmedia.com
Editorial Reprints **Jill DeVries**
248-244-1726 devriesj@bnpmedia.com

New Products Conference
R&D Applications Seminar
Margaret Whalen
630-694-4347 whalenm@bnpmedia.com

ProductInnovationXchange Event
Layne Skoyen, Director
952-736-9373 lskoyen@pi-xchange.com

Circulation
Audience Development Manager **Amy Schuler**

Subscription Information:
Tel. (847) 763-9534, Fax (847) 763-9538,
PF@halldata.com

***KidsFoodTrends* newsletter subscriptions:**
Janet Martinelli, martinellij@bnpmedia.com, fax: 610-436-6277
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Low-sodium beverages with enhanced potassium; lose fat instead of weight; nanotechnology in functional foods and beverages; dried cherry tomatoes for food fortification; coffee aids women's memories; a new line of berry extracts; and more.

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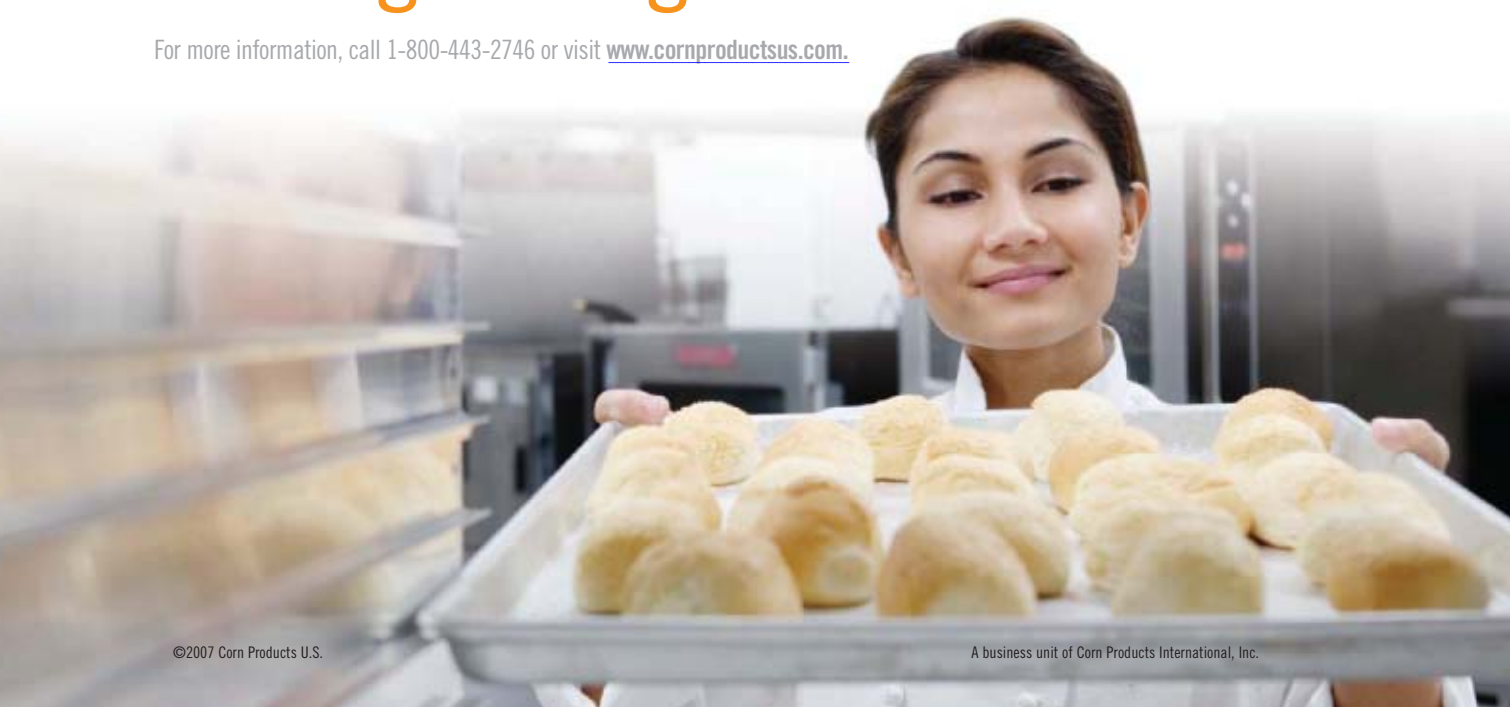

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Big Feet

PREPARED FOODS NEW PRODUCTS CONFERENCE
October 14-17, 2007 · Naples Grande Resort, Naples, Florida Mintel

Need-to-know Basis

Convenience is the number-one trend driving packaged foods. Did you know that Boomers define convenience in the kitchen differently than Generation X, and this impacts food choices?

Good-for-you-foods are often "taste-challenged." Did you know new discoveries are explaining why we like or dislike certain foods and that this is leading to new approaches in developing flavorful, healthy foods?

Companies are pressed to develop truly new products with minimal resources. Did you know that General Mills is practicing "open innovation," a method that leverages new products and technologies created outside the company?

Latino foods may be the most trendy of all ethnic cuisines. Did you know that Latinos come from 20 countries, each with a unique food heritage and thus with different food expectations?

Obesity could be thought of as the number-one health issue. Did you know that there are ethical and positive opportunities for new food products that entice consumers struggling with weight management?

These are the focus of just five of the over 15 presentations at *Prepared Foods*' 25th New Products Conference. Insightful presentations, networking with industry leaders and interactive sessions with new foods from around the world or with creative flavor combinations from the Culinary Institute of America will challenge, teach and entertain you.

October 14-17, 2007, Naples Grand Resort, Naples, Fla.

See www.PreparedFoods.com/npc for more information or contact Marge Whalen at whalenm@bnpmedia.com.

The concepts of carbon footprints and food miles have received much press. The benefits of local produce consumption include freshness, taste and community support. Plus, transporting foods fewer miles "from farm to fork" would seem to consume less fossil fuel. A recent Zogby Interactive poll found that 88% of Americans wish retail foods were labeled with country of origin. The U.K. grocery chain Tesco has committed to reducing its carbon footprint, defined by Wikipedia as "the total amount of CO2 and other greenhouse gases, emitted over the full life cycle of a product or service." (Tesco will measure its "direct carbon footprint" that excludes the energy food suppliers require to produce and transport food.) Such efforts are useful and good. However, I also am proud to be a part of an industry that processes food and transports it globally.

Growing up in Minnesota, where the growing season extends from July 15 to 19, I developed an early appreciation for "imported" and preserved food. My mother pointed out that bottled orange juice helps prevent scurvy and canned carrots help vision. Although I now write about nutrients for heart and gut health, it should be remembered that fortified and preserved foods, supplements and mass transportation are hugely instrumental in eradicating nutritional diseases, such as rickets and pellagra, in many parts of the world. In addition, the benefits of reduced food miles are not always clear.

In the report "Food Miles—Comparative Energy/Emissions Performance of New Zealand's Agriculture Industry," researchers considered numerous agricultural factors like water and fertilizer use, as well as food miles, to calculate that a ton of New Zealand lamb shipped 11,000 miles to Britain produced 1,520 pounds of carbon dioxide compared to British lamb that produced 6,280 pounds.

A *New York Times* writer, James McWilliams, notes that it is thus four times more energy-efficient for Londoners to buy lamb imported from the other side of the world than to buy it locally. This was also true for certain other foods. It is impossible for most of the world to feed itself a diverse and healthy diet with only local foods, and consumers will always demand choices beyond what the season offers.

On a personal note, I'm now enjoying my overly bountiful tomato crop. Should I can them, transport them to work or leave bags of them on my neighbors' doorsteps in the dark of night (they have grown excess, too)? pf

Claudia Dziuk O'Donnell
Chief Editor
pfeditors@bnpmedia.com

Hitting the Shelves

The Last Straws

Many people say taking the time for a healthy breakfast is getting harder to do. With fewer people sitting down for the morning meal, consumers are looking for more convenient ways to eat a healthy breakfast. Kellogg may be offering a solution for parents looking for a way to ensure that their children get the breakfast they need to fuel them for a long day of school and play, with the introduction of its Kellogg's Froot Loops Cereal Straws.

Kellogg actually launched this product concept in Europe in 2005. Now, after two years, it is moving the product stateside. So what is it? The cereal straws are edible, fruity tubes for sipping milk. Each six-inch straw has a crunchy outer shell and a fruity inner lining, and can be eaten for breakfast, after school or on the go.

This product also differentiates itself from the Sipahh milk-flavoring straws available in some countries because it can serve as a full meal alternative.

Organic is Everywhere

Organic is everywhere, and mainstream manufacturers are trying to find ways to capitalize on this fast-growing trend. Regardless of category, there has been an incredible influx of traditional and well-established U.S. brands going organic. The tea category actually has a significant amount of organic activity already.

More than 100 new organic products were launched in the U.S. in the last year. However, many of these products were among smaller, less-known brands. Many of the smaller brand launches come from non-traditional channels, such as natural food stores and gourmet retailers. Unilever Bestfoods is taking this trend into the mainstream tea category with the launch of its Lipton Organic Natural Tea, available in a 1.2oz pack containing 18 tea bags. The product is certified tea that is 100% natural and contains no additives, preservatives or artificial coloring.

From the Top

Some people say that the best part of the muffin is the top, but how does someone satisfy that craving for a fresh-baked muffin top without making a trip to the local bakery when they want a quick snack on the go? Malt-o-Meal, traditionally known for its hot and cold cereal products, has tried to solve that question with the introduction of its Blueberry Muffin Tops Cereal Snack'ers 100 Calorie Packets.

The launch takes a successful cereal product, Malt-O-Meal Originals Blueberry Muffin Tops Cereal, and offers it as a convenient and healthy snack alternative. Each package contains six 100-calorie, single-serve units of blueberry muffin-flavored crisps made with whole-grain cereal and natural and artificial flavors. It also contains eight vitamins and minerals and is free of trans fat. The launch could be the beginning of a new trend for ready-to-eat cereal manufacturers.

Slipping a Mickey

Nothing is more traditional on a hot summer evening than a cookout in the backyard with family and friends. A staple of that summer cookout is a hamburger, yet pre-packaged burgers generally are very similar. Birchwood Foods has found a way to make its hamburgers stand out with the introduction of its Disney Mickey Burgers. Kids throughout the country will take notice when their burger comes in a familiar shape—Mickey Mouse's head.

The product can be found in the freezer section, and each package comes with eight patties made with 100% beef. Each burger contains 16g protein per serving, and the ground beef is 85% lean. It retails in a 24oz pack with Disney stickers inside. The company also is introducing Pirate Burgers shaped like a flag. Each Pirate Burger package comes with free press-on tattoos. This simple concept could lead to sales at the register—and an entirely new type of burger, personalized to the individual consumers' shape preference.

Free Time

Globally, consumer interest in gluten-free products has exploded in the last few years. This trend crosses category and country boundaries, with Europe leading the way. In the U.S., manufacturers' responses to the desire for gluten-free products are in the form of new product introductions. In 2006, gluten-free new product introductions doubled from the year before. Through June 2007, manufacturers are on target to launch more than 600 gluten-free new items. These new product launches are most prevalent in the snacks and bakery category, similar to global gluten-free new product category trends. However, the baby food category was the third highest category globally for gluten-free new product launches, yet in the U.S., the category has not yet reached the top 10. This would be a category to watch in the next few years, as new parents become more educated and concerned about food allergens in their children's food.

Glute-free Glut

U.S. Gluten-free New Product Category Introductions (by Year, Ranked by 2006 Launches)

	January-June 2007	2006	2005
Bakery	62	125	58
Snacks	74	117	75
Sauces and seasonings	20	90	38
Beverages	10	62	24
Processed fish, meat, eggs	27	48	8
Other	32	46	16
Desserts and ice cream	11	39	23
Confectionery	34	37	2
Dairy	25	33	15
Meals and meal centers	4	30	20
Side dishes	18	17	38
Total	317	644	317

Source: Mintel GNPD

GlobalTrends

Products that target specific demographic groups are not a new concept. In fact, some could argue that it is the essence of marketing. Milk companies have introduced products with kid-focused flavors (e.g., chocolate milk). Products with low-/no-/reduced-fat claims appeal to those concerned about weight management or a healthier diet. However, beyond these launches, milk products have remained relatively similar throughout the years. Well, it seems a new trend has emerged in the milk category—products fortified with added vitamins, minerals and other nutrients tailored for the targeted consumer.

For example, Guanfeng Food and Drink launched the Guanfeng Aloe Essence Breakfast Milk in China, specially designed for women. The shelf-stable milk product is made with aloe vera, milk powder, *bifidus* factor, iron, zinc, calcium and protein to help meet the specific health nutrition needs of a woman. It is packaged in individual sachets for convenience.

Another great example is the launch of Danone's La Serenisima Danonino Uvaláctico Alimento Lacteo a Base de Leche (grape-flavored milk drink) in Argentina. The product contains iron, zinc, calcium, proteins and vitamin D. It was developed with pediatricians and retails in a 200g container with facts about the planets.

Everyone is looking for a meal that is both tasty and convenient. If the meal is healthy, that makes it even better. In the U.K., Marks & Spencer has tried to answer all three with the release of its Super Wholefood Salad under its private-label Eat Well brand. It contains tender stem broccoli, butternut squash, asparagus, pomegranate seeds and toasted pumpkin seeds with couscous and a lemon-and-herb dressing. The product is ready-to-eat and suitable for vegetarians. It is free from colors, flavorings or preservatives. Marks & Spencer also offers other products in the line including: Arbroath Hot Smoked Loch Muir Salmon Nicoise; Honduran King Prawns; Loch Muir Salmon Primavera; Chicken Tikka; Morrocan Spiced Chicken; Buffalo Mozzarella, Roast Aubergines and Tomatoes; Sweet Chilli Chicken; Chicken and Honduran King Prawn Laksa; Chicken Caesar; Greek Feta and Falafel; Chicken Yakitori; Asian Beef Noodles; Peking Duck; and Seafood Linguine.

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Warning Signals

Manufacturers must be more allergen aware than ever, as their package and labels serve as a guidepost to at-risk consumers. While a small population of consumers actually has food allergies, they have a peripheral impact, particularly in schools, where certain products will be banned from classes if even one student has a food allergy.

William A. Roberts, Jr., Business Editor

Whether due to regulations or consumer concerns (or even a combination of the two), allergen awareness is more notable than ever. At the Institute of Food Technologists (IFT) Expo this year, a number of suppliers featured allergen notices about the samples being served. While serving bites of cheesecake featuring a peanut butter flavor, the representatives of one large company in particular made sure to mention the allergens present each time the sample was served. In fact, the server refused to give a bite to one attendee who appeared to be under the age of 18, noting that they were only serving adults due to the allergens present in the sample.

The inability to eat certain ingredients has led to something of a cottage industry within the food and beverage segment, as parents of allergic children have resorted to their own ends in creating safe snacks and treats.

According to the Food Allergy & Anaphylaxis Network (FAAN), about 12 million Americans suffer from a food allergy, as the number of food-allergic consumers has grown tremendously in recent decades. This growth could be the result of increased awareness or improved diagnoses. For example, gastrointestinal issues resulting from a milk allergy might have been regarded as simply a weak stomach a generation ago. Granted, there is the possibility that consumers are too quick to self-diagnose their food intolerance as a full-fledged allergy, but the numbers are dramatic. The FAAN notes that, between 1997 and 2002, peanut allergies doubled from one in 250 children to one in 125. This suggests that close to 1% of children might suffer from peanut allergies alone.

Of the 12 million Americans with food allergies, approximately 6.9 million are allergic to seafood, and 3.3 million are allergic to peanuts or tree nuts, according to FAAN. Figures from the group indicate one in every 17 youngsters under the age of three suffers from a food allergy, as do some 2.2 million school-aged children. In fact, it is in schools where the effects of allergen awareness may be most profound. When one student suffers from a food allergy, many entire classes are prohibited from having a range of snacks, and this peripheral effect could well have untold consequences upon the tastes and preferences of an entire generation.

School Responsibilities

The National Association of Secondary School Principals has outlined guidelines for "managing students with food allergies," noting the schools, the students, their parents and physicians must work together to minimize risks and "provide a safe educational environment." The guidelines call for the child's family to work with the school to develop a plan to accommodate the child's needs, to provide instructions

The front of Coca Loco snack bars from Enjoy Life feature an "Allergen Free" logo, as well as the phrases "nut and gluten free" and "made in a dedicated bakery" featured prominently.

and medications, and to educate the child in the self-management of the food allergy. The schools must be "knowledgeable about and follow applicable federal laws…;" review the records submitted by the parents and physicians; include food-allergic students in school activities ("Students should not be excluded from school activities solely based on their food allergy."); coordinate with the school nurse to make sure any medications are appropriately stored; enforce a "no eating" policy on school buses "with exceptions made only to accommodate special needs under federal or similar laws, or school district policy;" and take threats or harassment against an allergic child "seriously." The student must not trade food with other students, not eat anything with unknown ingredients or known to contain any allergen, be "proactive in the care and management of their food allergies and reactions based on their development level" and immediately notify an adult if they have eaten something possibly containing the food to which they are allergic.

This inability to eat certain ingredients has led to something of a cottage industry within the food and beverage segment, as parents of allergic children have resorted to creating safe snacks and treats themselves. The companies may be small, but they are numerous, each with a story something like that of Gak's Snacks: "Our son was a toddler when he was diagnosed eight years ago with multiple food allergies," explains Jill Robbings, president of the company. "The medical part of coping we learned quickly: Total avoidance of even traces of various foods."

It was the emotional side that proved challenging and prompted Robbings to write an allergy cookbook and eventually to create ready-made products including cookies and coffee cakes, as well as allergen-tested ingredients. The same story can be heard in small companies throughout the industry, as desperate parents have taken matters into their own hands. Furthermore, major companies are joining the bandwagon by offering allergen-free products and, probably more importantly (no doubt prompted by regulations and parental pressure), labeling products to make consumers aware of exactly what is in the product and what might have come into contact with it during the manufacture.

Too Much

Despite the preponderance of these labels, there are fears that fewer individuals are taking them seriously. A 2003 FAAN survey found 85% of parents surveyed heeded the warnings; by 2006, that number had dropped to 75%. "They are ignoring the warnings, because the warnings are on too many products," fears Anne Munoz-Furlong, CEO and founder of FAAN. "They have become numb to these warnings."

Part of the problem could well rest in the products. The study tested products with a warning label and found 93% did not actually contain an allergen. As Munoz-Furlong explains, "A lot of companies tell us their legal counsel has advised them to put labels on their products to protect their liability." She hopes the study will prompt the industry and

Restaurants and Prominent Allergens

Allergen Claim Appearances Since 2005

Marketing Claims	1Q 2005	2Q 2005	3Q 2005	4Q 2005	1Q 2006	2Q 2006	3Q 2006	4Q 2006	1Q 2007
Gluten-free	21	21	21	65	71	70	70	85	103
Wheat-free	19	19	19	19	19	19	19	19	19
Lactose-free	15	15	15	15	15	15	15	15	18

Note: Results represent data sourced from the 350 largest U.S. chain restaurants and 150 independent restaurants, and 50 top chef-owned restaurants collected between 1Q 2005 and 1Q 2007. Numbers represent the cumulative results of the quarters in which an item was mentioned on a menu.
Source: Mintel Menu Insights (Chicago), www.menuinsights.com; Ph: 312-932-0400

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Added Fiber Product Introductions
Source: Mintel International 2007
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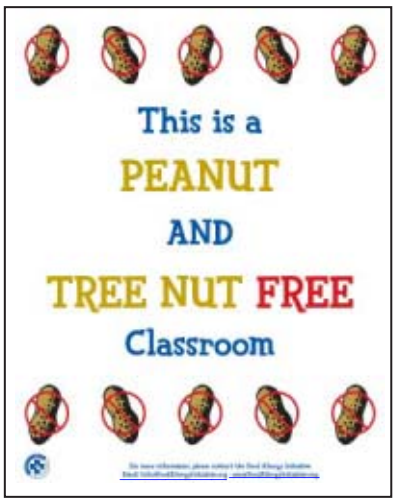

The Food Allergy Initiative offers this poster as "a great way of letting everyone know your child's classroom is peanut free."

government to review and revise the food allergy warning system.

Last year, the FDA implemented new labeling regulations that it claims address 90% of documented food allergies. The Food Allergen Labeling and Consumer Protection Act went into effect in January of 2006, mandating food manufacturers to declare food allergens in plain language on their ingredient lists. These regulations demand labeling of eight major food allergens in the U.S.: milk, egg, peanut, tree nut, fish, shellfish, wheat and soy. In other parts of the world, regulations can be more stringent. Since 2005, the E.U. has dictated that products must label 12 allergens, and others are expected to join the list soon. Already, the market for products without allergens is booming. According to Mintel, the number of "free-from" products in the U.K. has grown by more than 300% since 2000, as the U.S. likewise has seen a promulgation of "may contain" labeling.

While such labels may have good intentions (a heightened sense of responsibility to eliminate any possible consumer doubt), consumers tend to view the "may contain" labels as a legal cop-out, leading to the FAAN-noted mistrust of the labels. Further compromising the labeling system could be the almost routine list of products being recalled due to undeclared ingredients or contamination—in products from companies large and small. Luckily, the industry and others are looking into counteracting food allergies, with methods of variable promise.

As noted in the April 29, 2007, *Parade* magazine, "In clinical studies across the country, doctors and researchers are experimenting with new methods such as: Chinese herbs to neutralize the allergic switches; injections of modified allergens that work much the same way as allergy shots do in hay-fever sufferers; and desensitizing kids…by increasing doses of allergens." The efforts appear to be paying off or to have potential: one notable researcher believes effective treatments, at least for peanut allergies, are less than five years away.

Safe Areas

In the meantime, allergic and food intolerant consumers are left to search for safe foods, and one of the most prolific segments in the allergen area in recent years has been in the realm of gluten-free foods for those suffering from celiac disease (CD), a digestive disease which damages the

Gluten-free in Restaurants

Allergen Claims on Menus in Select Restaurants

Restaurant	Gluten-free
Outback Steakhouse	400
Legal Sea Foods	321
Ryan's Grill	240
Bonefish Grill	194
Carrabba's Italian Grill	171
P.F. Chang's	145
Pei Wei Asian Diner	45
Candle Cafe	36
First Watch	32
Bennigan's	19

Note: Results represent data sourced from the 350 largest U.S. chain restaurants and 150 independent restaurants, and 50 top chef-owned restaurants collected between 1Q 2005 and 1Q 2007. Numbers represent the cumulative results of the quarters in which an item was mentioned on a menu.
Source: Mintel Menu Insights (Chicago), www.menuinsights.com; Ph: 312-932-0400

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See Food Master-*INGREDIENTS*, p. 36-57

DANISCO

First you add knowledge...

With the number of gluten-free products on store shelves well into the thousands, it is not surprising to see new introductions catering to more than one mainstream trend. Take, for instance, thinkproducts' thinkOrganic cherry nut bar. This raw fruit and nut snack bar mentions "gluten free" on the front of the package. Furthermore, the ingredients legend makes sure to note "organic" before every ingredient.

small intestine and which interferes with the absorption of nutrients from food and whose sufferers cannot tolerate gluten. Far more prevalent than once believed, the University of Chicago estimates one in 133 people cannot eat wheat, rye or barley for fear of damaging the small intestine and a variety of other maladies; for those with a relative unable to consume gluten, the number is even more intimidating: one in 22. Furthermore, there is a significant percentage of the population self-diagnosing their own food allergies. *The Journal of Allergy and Clinical Immunology*'s June 2007 issue featured a study examining self-reported food allergies. Among all survey respondents, "The prevalence of self-reported food allergy is 9.1%," the study finds, "with 5.3% of all respondents reporting a doctor-diagnosed food allergy." It also examined labeling as it relates to those consumers, finding, "Several label issues, such as words on some ingredient lists being too technical or hard to understand and food labels not always alerting persons to new ingredients, were reported as serious or very serious obstacles for managing an allergy."

Whether technically allergic to gluten or not, a growing number of Americans believe gluten has contributed to ills ranging from infertility to anxiety to gas. For the record, doctors are reluctant to attribute many of these conditions to gluten. However, store shelves now feature more than 1,500 gluten-free foods for individuals seeking to avoid the ingredient, according to the Mintel Global New Products Database (GNPD). The items also fetch a greater price: 227g of gluten-free pasta retails for more than $3—more than triple the price for a package one third the size of regular noodles. The sheer bulk of products with gluten in a variety of forms has led researchers to ponder an interesting proposition: perhaps the incidence of gluten-intolerant consumers is rising because wheat's prevalence in the Western diet causes consumers to overdose on it.

On the foodservice side, gluten-free menus are, if not common, at least less unusual than in the recent past. P.F. Chang's, Chick-Fil-A, Subway and Adobo Grill are just a few of the nationwide chains featuring menus specifically tailored to consumers suffering from CD. Sufferers are lucky to live in a digital age, where the Internet abounds with websites devoted to gluten-free restaurant menus and retail products. Considering the growing mistrust of product labels, communicating to these consumers should start at the website level. Pf

Website Resources:

www.foodallergy.org — The Food Allergy and Anaphylaxis Network

www.uchicagokidshospital.org/pdf/uch_007937.pdf — Fact sheet on celiac disease from the University of Chicago

www.glutenfreerestaurants.org — Gluten-free Restaurant Awareness Program

www.gakssnack.com — Gak's Snacks

www.foodyoucaneat.com — The Food Allergy Kitchen

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See Food Master-*INGREDIENTS*, p. 118-119

A Flavor Challenge

Many consumers turn to marinades and/or cooking sauces to add flavor and variety when cooking meats. However, the market for these products is challenging. New product opportunities arise in niche markets and with novel ideas.

Kristin Rose, Contributing Editor

According to Mintel International, sales of cooking sauces and marinades in the U.S. were expected to generate sales of roughly $1.4 billion in 2006. Although sales remained constant from 2001-06, when inflation is taken into account, the market has actually dropped 11% since 2001. Factors contributing to the decline include the rising popularity of pre-marinated meats, the number of consumers who like to make "homemade marinades" and the desire among an aging population to reduce sodium intake.

Sales of refrigerated sauces/marinades grew 19.9% from 2001-06, but products like McCormick & Co.'s Slow Cooker Seasonings and Grill Mates captured consumers' attention in the dry sauce segment.

Quest for Convenience Dampens the Category

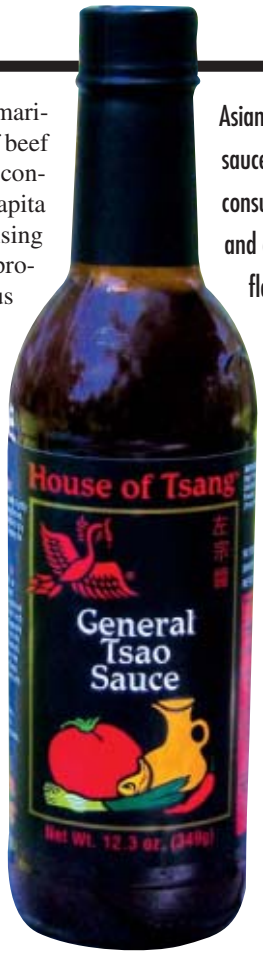
Many food and beverage manufacturers recognize the need to consider the on-the-go lifestyles of consumers when creating their products. Yet even in a category focused on convenience like packaged cooking sauces and marinades, consumers continue to seek ultra-convenient options. This trend is demonstrated by the shift away from dry sauces in favor of wet sauces that require less preparation and produce less mess. Food, drug and mass merchandiser (FDM) sales of wet sauces, excluding Wal-Mart, increased 4.3% from 2004-06 to $612 million, while sales of dry sauces dropped 2.2% to $577 million. Furthermore, sales of refrigerated sauces/marinades are growing at the fastest rate (19.9% from 2001-06 in FDM outlets, excluding Wal-Mart) because consumers believe these products offer better quality and freshness than their shelf-stable counterparts. Products such as Nestlé's Buitoni Refrigerated Sauce and Contadina Sauce contributed to the success in the wet sauces segment. Meanwhile, products like McCormick & Co.'s Slow Cooker Seasonings and Grill Mates captured consumers' attention in the dry sauce segment.

Perhaps the most telling evidence of the convenience trend is the proliferation of pre-seasoned and pre-marinated meats—which negatively impact the cooking sauce and marinade market. Tyson Foods, the largest meat processor in the world, is using pre-seasoned meats to drive sales. In fact, the company plans to drive sales 50% through such "value-added" products. Even retailers are infringing on category sales by offering pre-marinating services. Safeway, for example, launched a "marinade service" offering shoppers the option of having fresh cuts of meat marinated at no additional cost.

According to the 2004 National Meat Case Study, pork is the leader in value-added products, with 12% of pork packages featuring marinades or seasoning. The meat industry anticipates the growth in pre-marinated meats has just begun

and is spurring demand by experimenting with marinating methods, highlighting underutilized cuts of beef and expanding flavor innovations. Unlike chicken consumption, which has increased significantly, per capita consumption of beef has been flat, due in part to rising costs. In response, meat industry suppliers are promoting value cuts of beef to cater to price-conscious shoppers, many of whom require marinades to add flavor and increase tenderness. While this could spark increased interest in category sales, meat suppliers are also increasing pre-marinated offerings of lower-priced beef cuts. Overall, pre-marinated meats increase visual appeal of the meat itself, offer portion control and longer shelflife—not to mention meeting the desire for greater convenience.

Despite the prevalence of pre-marinated meats, Mintel research indicated that 64% of respondents who use marinades use "homemade versions." Some of the reasons respondents cite for not using ready-made sauces is that homemade versions are tastier (40%) and healthier (32%). Indeed, suppliers of cooking sauces and marinades must contend with significant competition outside the category.



Asian sauces account for a large percentage of the cooking sauce and marinades market, validating the notion that consumers are seeking more ethnic taste experiences, and consumer interest has broadened to include bold flavors. For example, House of Tsang launched General Tsao Sauce, which balances slightly sweet, spicy and tangy flavors.

Healthy Choices

Manufacturers of cooking sauces and marinades are more cognizant of health trends and are adapting new product development to meet current demands. As a reflection of the pursuit of healthiness, chicken consumption is on the rise. With annual per capita consumption up 11.7% from 2001-05, market players are responding with an influx of cooking sauces and marinades to liven up the flavor of chicken. According to Mintel's exclusive consumer research, 88% of respondents use marinades on chicken. In 2006, 120 new sauces for chicken had been launched, per the Mintel Global New Products Database (GNPD)—more than double the number of new product launches in 2004.

An area emerging in response to health trends is the use of marinades on vegetables. While only 7% of Mintel's respondents indicated such applications, the opportunity to make vegetables tastier, yet still healthy, through marinades is an untapped opportunity for both makers and marketers.

Heightened interest in health issues has also spawned demand for all-natural and organic meats. The Organic Trade Association reports that organic meats and poultry are the fastest growing organic food, up 55% in 2005 over 2004. Organic condiments such as ketchup, mustard, salsa, innovative sauces and salad dressings were the second-fastest growing category, with a 24% increase in sales. Some consumers who buy natural meats say they taste better than conventionally raised meats. Mintel's research found that 11% of consumers do not use marinades or seasoning because they "don't want it getting in the way of the taste of the meat."

Consequently, the rise in sales of organic meats could lessen the need for marinades. However, to match the rising interest in all-natural and organic products, purveyors of cooking sauces and marinades are launching more products to fit this need. Between 2004 and 2006, the number of new cooking sauces and marinades with "natural" claims increased 61.4%, while products with an organic claim declined by 1.8%, per GNPD. World Variety Produce promotes the Melissa's Good Life Food product line, which includes organic stir fry sauces, marinades, tofu sauces, grilling sauces and dip mixes. The line capitalizes on flavor trends with sophisticated offerings such as Lime Cilantro, Smokey Chipotle and Thai Peanut marinades.

The healthiness of cooking sauces and marinades, often laden with sodium, is a concern for some consumers. In particular, people (most often older consumers) who need to monitor and/or limit sodium intake due to health problems are likely to avoid pack-

Chicken and beef may be the most popular to marinade, but marketing usage with vegetables provides an untapped opportunity—in light of Americans' quest for healthier eating habits.

Cooks Flavor Foods

Types of Foods Marinated, September 2006

Chicken or other poultry	88%
Steaks or other red meat	88%
Salmon, tuna or other types of fish	34%
Shrimp or seafood other than fish	32%
Lamb	15%
No meats, just vegetables	7%
Other	5%

Source: Mintel/Greenfield Online
n=1,384 adults aged 18+ who use marinades and have Internet access

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Packaged vs. Homemade

Types of Marinades Used, September 2006

A store-bought marinade (ready-to-use)	71%
A homemade marinade where you combine all ingredients and seasonings	64%
A marinade mix, such as a dry seasoning mix	41%

Source: Mintel/Greenfield Online
n=1,384 adults aged 18+ who use marinades and have Internet access

> Convenience is key in this market, as more than seven out of 10 respondents use a ready-to-use marinade.

aged marinades. Aware of such concerns, suppliers have launched lower sodium versions, such as the May 2006 debut of Kikkoman Less Sodium Soy Sauce and Mrs. Dash release of new 10-minute Marinades, which are said to be free of salt.

Flavor Inspirations

Another important factor in the cooking sauce and marinades market is the influence of ethnic populations. According to Simmons NCS, nine out of 10 black respondents are slightly more likely to use some type of seasoning with penetration, in comparison to 82% of white households and 60% of other races. From 2001-06, the black population increased 5.7%, to represent 13.1% of the total U.S. population. As such, this is an important demographic to target, and marketers and manufacturers are wise to recognize their flavor preferences.

The second-largest and -fastest growing demographic is the Hispanic population. Growing 18.8% from 2001-06, Hispanics represent nearly 16% of the total U.S. population. Such shifts in the population have served to increase the prevalence of Hispanic food and flavor influences, which has also encouraged growing interest in other ethnic flavors, especially Asian, Indian and Mediterranean. In fact, Asian sauces account for an increasing percentage of the cooking sauce and marinades market, validating the notion that consumers are increasingly seeking more ethnic taste experiences. According to Mintel, FDM sales of Asian sauces increased sales 3% from 2004-06, generating 15% of total market sales. Suppliers are consistently launching new products to meet flavor demands, such as La Choy's Garlic Ginger Stir Fry Sauce, which is said to be inspired by traditional Asian cuisine.

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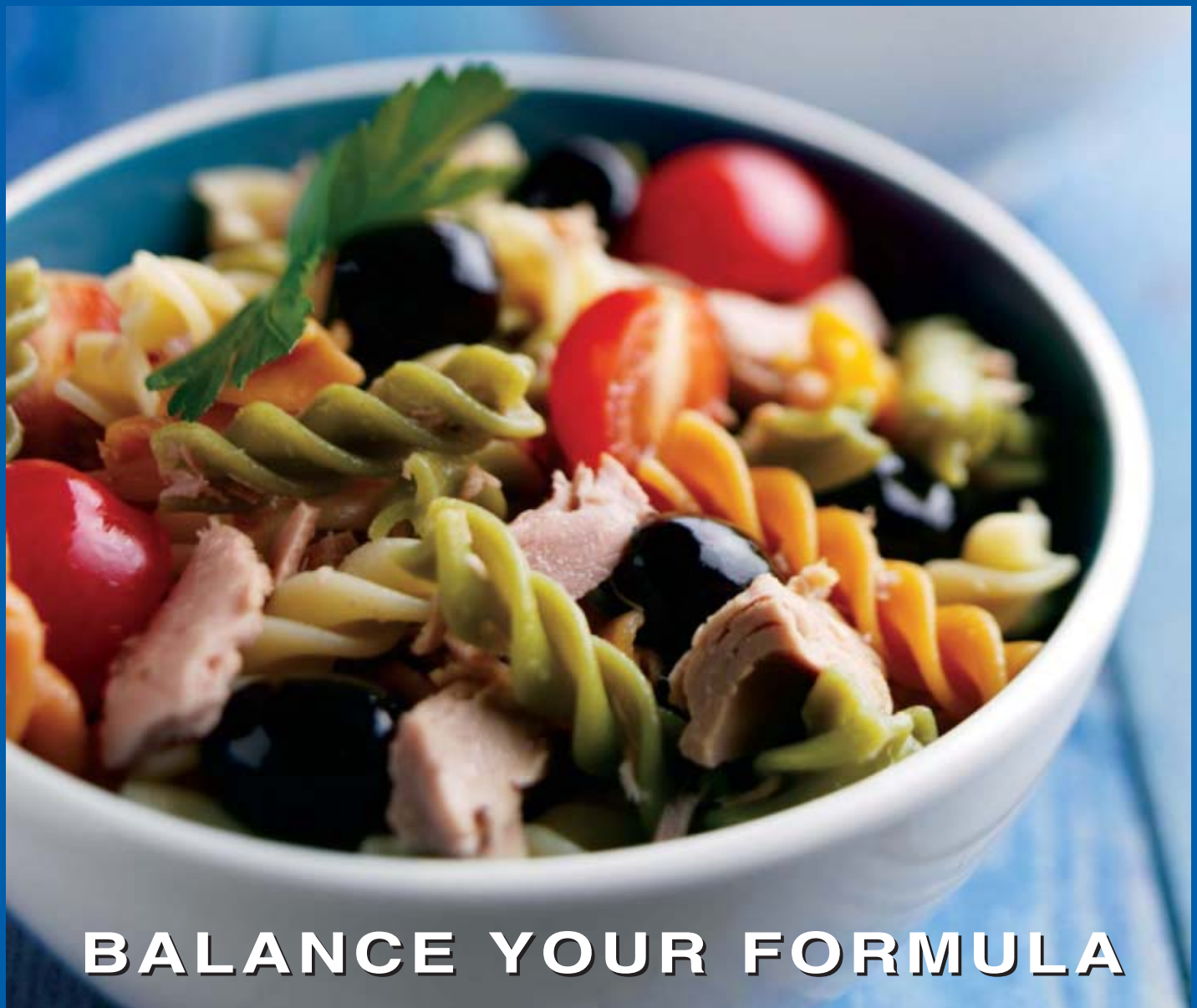

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Consumer interest has broadened to include bold flavors, and combining fruit-sweet-hot profiles has emerged as an attractive option. Many Asian products meet such demands. In 2006, House of Tsang launched General Tsao Sauce, which balances slightly sweet, spicy and tangy flavors. Classic flavor profiles still remain popular, however, and suppliers continue to expand traditional flavor marinades. Market leader McCormick & Co. added Parmesan to its Oven Baked Seasonings line in 2006. More sophisticated combinations are also a hot trend. In 2006, Stubb's released Rosemary-ginger Spice Rub and promoted it as an ideal seasoning for chicken, pork, fish and vegetables. Yet another example of unusual ingredients being utilized in marinades is found in Lulu Lavender and Honey Grilling Sauce—a product infused with the light perfume of lavender blossoms and said to impart a crisp, flavorful crust to chicken and duck, lamb and whole grilled fish.

Consumers have long been concerned about the sodium levels of cooking sauces and marinades. In response, processors have launched lower sodium alternatives, such as Kikkoman Less Sodium Soy Sauce and Mrs. Dash's 10-minute Marinades, which are said to be free of salt.

The Future—Marinades for One

Mintel predicts the total U.S. sales of cooking sauces and marinades will remain virtually unchanged at current prices but is likely to decrease 16% at constant prices from 2006 to 2011. Flavor expansion represents a future opportunity for new product innovation. Flavor inspirations will likely be driven by the rising popularity of ethnic marinades and sauces, with inspirations coming from South American, Indian, Middle Eastern and Mediterranean cuisines. Health trends will also continue to influence new products, with sodium content and all-natural/organic claims playing a major role in marketing.

However, Mintel suggests the growing number of one-person households could be a factor that may compromise future sales.

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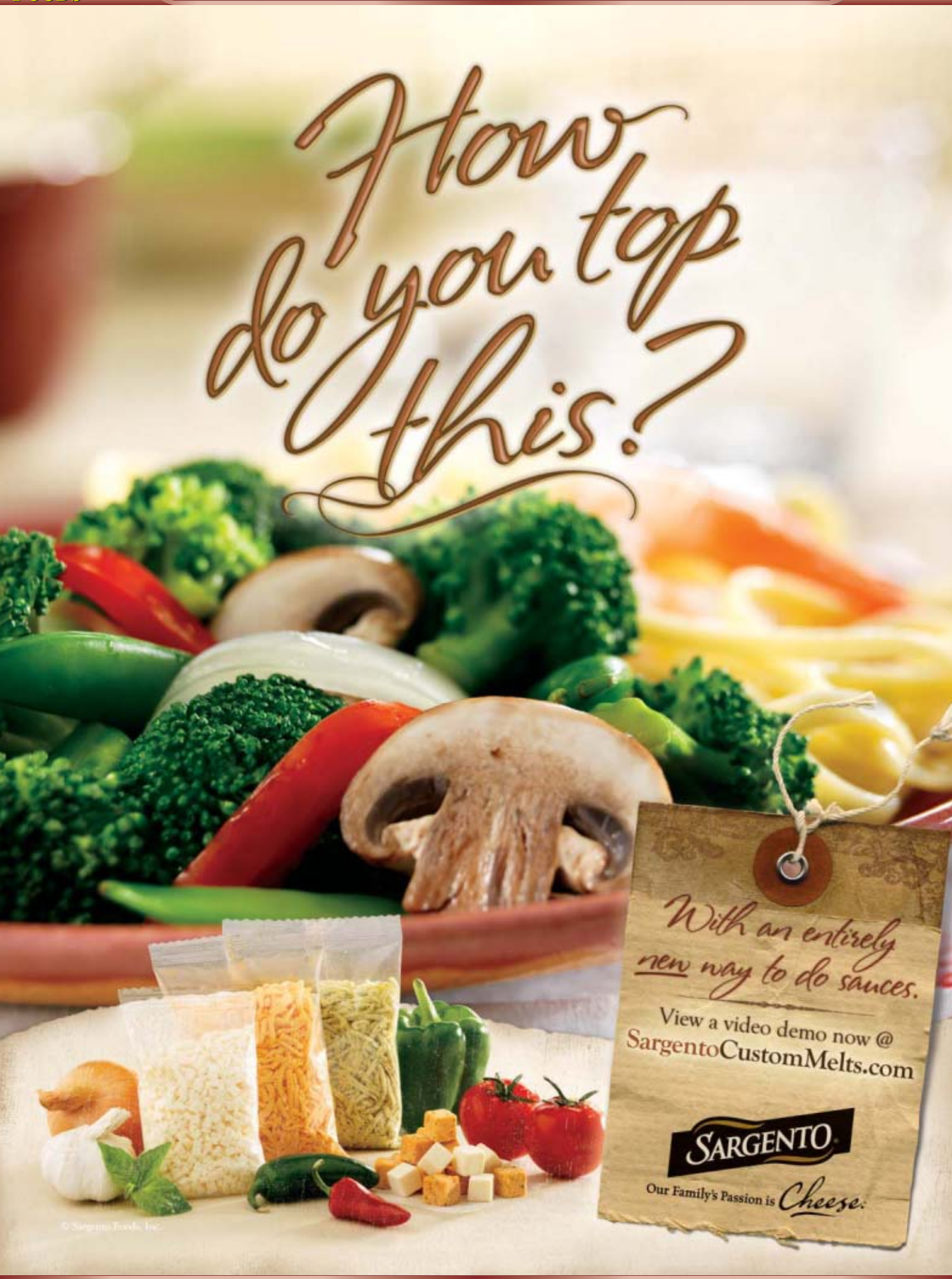
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PREPARED FOODS

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qMags

Tavern on the Green, the New York City landmark restaurant, is launching an exclusive line of branded sauces, marinades and dipping oils, available through a new company called http://taverndirect.com. Some 12 products are available, including three signature sauces: the "1870 Steak Sauce," marking the year the Tavern was built; the "Central Park Signature Dipping Oil;" and the "Chandelier Chardonnay Marinade." "Research shows that people are craving diverse, rich flavored foods," said Howie Jacobson, partner, TavernDirect.com. "The market for marinades, sauces and similar products is at an all-time high, with consumers being encouraged to cook at home by chefs, grocery chains, and cooking shows.

Mintel's research indicated people who cook solely for themselves are less likely to use marinades (70% versus 85% of all home cooks) and packaged seasonings (66% versus 82% of all home cooks). Between 1995 and 2005, the number of one-person households increased 20.7%. If this trend continues, Mintel believes it is imperative that market suppliers work toward single-serve innovation in the cooking sauce and marinade category. Pf

This article contains information from the Mintel report "Cooking Sauces and Marinades—U.S., December 2006." Please visit http://reports.mintel.com for more information or call Mintel at 312-932-0400.

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In the Shower

For several years, the pomegranate has generated a tremendous amount of buzz. Study after study touted its healthy properties as it found its way into various and sundry items across the retail spectrum, not to mention its incorporation into beverages in both retail and foodservice. As time has passed, it still holds sway in a number of formulations, but developers appear to be moving on to other fruits of interest. The acai berry has been seen widely in new products, and now, NBI Juiceworks has introduced a juice incorporating a better-known but rarely seen fruit.

Sun Shower 100% Pure Pressed Nectarine Juices promise the fresh summer taste of nectarines all year round. The company claims the juices are less acidic than ordinary orange juice, while containing 20% fewer calories per 8oz serving—not to mention two servings of fruit. Other benefits include potassium, vitamin C, antioxidants and phyto-nutrients.

Mini-sizing

Serving sizes have been a topic of serious debate in the industry for years, and of late, mainstream media have likewise jumped on the bandwagon. Many have derided the industry, particularly restaurants, for skewing consumer perceptions about portion sizes.

Recent years have seen some restaurants and retail products address these notions head-on, most notably the "Right Portion, Right Price" menu at T.G.I. Friday's. Few, however, have gone quite as far as Heinz has with its new addition to its Weight Watchers line.

A response to Simmons consumer research, which finds 21.6% of adults eat several small meals throughout the day, the Weight Watchers SmartOnes Anytime Selections are described as the "first line of mini-meals in the frozen nutritional category." Seeking to help consumers "balance busy schedules with the desire to eat well," the products are available in two flavors: Chicken and Cheese Quesadilla and Calzone Italiano.

Harvest Time

Earlier this year, PepsiCo introduced Flat Earth, a line of fruit and vegetable crisps that managed to introduce a half-serving of fruits or vegetables in a snack format both familiar and convenient to American consumers. No large-scale competitors have emerged since, but there have been notable efforts to improve the healthiness of Americans' favorite snack.

Under its Nabisco banner, Kraft Foods is introducing Garden Harvest Toasted Chips, which promise to have 60% less fat than leading regular fried potato chips. The chips are baked with 100% whole grain and claim to provide "a good source of dietary fiber."

Similar to the Flat Earth products, Golden Harvest chips are made with real pieces of fruits or vegetables and provide a half-serving of fruits or vegetables in each 1oz serving. The Nabisco products come in four varieties: tomato basil, vegetable medley, apple cinnamon and banana.

Playing Taps

PepsiCo announced that it will provide consumers with more information about the source of the water used for its Aquafina line. The bottled water labels will read "Public Water Source," rather than the "pure water, perfect taste" verbiage that had appeared. The move comes after months of campaigning by Think Outside the Bottle. With this success, do not expect the campaign to rest on its laurels, especially considering it says "up to 40% of bottled water uses tap water as its source." The campaign's director regards Pepsi's response as "an important first step."

U.S. consumers spent $11 billion on bottled water in 2006, with Aquafina accounting for $1.3 billion. Pepsi was quick to note that, while Aquafina uses public tap water, it undergoes a filtration process prior to bottling. pf

Presumed Guilty

The obesity epidemic and associated health ills may have Americans feeling guilty about consuming their favorite dessert treats, but a recent survey suggests consumers manage to ignore those guilty sentiments when it comes to ice cream. More than two thirds of U.S. adults (67%) believe full-fat ice cream is worth the guilt, according to survey by Harris Interactive conducted for Denali Flavors. Nearly three quarters of men (73%) and a full two thirds (66%) of women would prefer to consume full-fat ice cream than full-fat varieties of other snacks—cookies, chips and candy among them.

"Ice cream has traditionally been about treating oneself, and this study suggests that consumers are willing to indulge," explains Neal Glaser, president of Danali Flavors, adding, "In some ways, the findings are surprising in light of the success of low-fat varieties of decadent ice creams."

More than half of respondents (52%) do not believe decadent flavors of ice cream (such as rocky road and moose tracks) can be low in fat and still taste good. Nevertheless, blind taste tests have indicated that the average consumer cannot tell the difference between low- and full-fat ice creams currently on the market.

Low-fat ice cream was the fastest-growing ice cream category in 2006, according to the International Dairy Foods Association (IFDA), yet the USDA notes full-fat varieties accounted for 63.8% of the frozen dessert market in 2005. The IFDA estimates the U.S. frozen dessert market is valued at more than $21 billion.

Playing Favorites

Americans' Top Five Favorite Ice Cream/Frozen Yogurt Flavors, by Servings

Ice Cream	
Vanilla	22%
Chocolate	9%
Butter pecan	5%
Vanilla bean	4%
Mint chocolate chip	4%
Frozen Yogurt	
Vanilla	14%
Strawberry	13%
Chocolate	7%
Cherry	6%
Cherry vanilla	4%

Source: The NPD Group, from its SnackTrack database

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As consumers continue their 'eat on the run' lifestyle, a manufacturer of ready-to-eat bars and snacks wanted to give their products a healthy edge over competitive products. GPC recognized this trend and found a way to help fortify these 'on the go' products with fiber. The result? A healthy alternative to other quick snacks that tastes great but also provides a solid nutritional component. Looking for a way to deliver that healthy edge? Let GPC help you find it.

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The Source

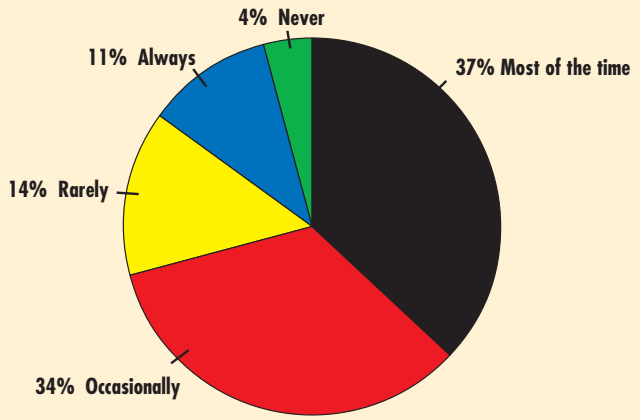
Nearly three quarters of American consumers believe it is important that they know the country of origin for all of the products they purchase; however, when it comes to food, the number is even larger—85%, according to a new Zogby Interactive poll. That same survey found 94% believe they have a right to know the country of origin of the foods they purchase. Admittedly, knowing the country of origin likely would have no actual bearing on the safety of the food, but 90% of respondents believe "knowing the country of origin will allow consumers to make safer food choices," says the Zogby poll.

Congress is considering expanding country of origin labeling beyond seafood to include meat, produce and other foods. A great majority of Americans support mandatory labeling: 88% want all retail foods labeled this way. Currently, the country of origin is checked at least some of the time: 37% said they check "most of the time," while 34% check occasionally. Some 11% always check, 14% rarely do, while 4% never bother.

Only 5% disagreed with mandatory country of origin labeling for foods. Of these, 63% say compliance would be too expensive and risked increasing food prices. Some 27% believe it does not matter what country supplies the food sold in the U.S., while 2% believe such labels could be unfair to foreign competitors.

Looking for the Label

Consumers Check for Country of Origin Labels:



Source: Zogby Interactive Survey; n=4,508 U.S. adults

The Zogby Interactive survey of 4,508 adults nationwide was conducted July 17-19, 2007, and carries a margin of error of +/- 1.5 percentage points.

For more information, contact Fritz Wenzel, Zogby's director of communications, at 315-624-0200, ext. 229.

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THE IN BOX:

For daily industry news updates, see the homepage of www.PreparedFoods.com and www.NutraSolutions.com.

■ Sargento Foods Inc. promoted Steve Foerstner, Ed Finnie and Brad Deckard to divisional sales managers. The company also appointed Kathy Ott as customer service director and Gary Visser as senior director of Planning & Supply. Sargento also acquired Portionables Inc.

■ Cognis Nutrition & Health named Wayne Howard as its new market development manager for functional foods and food technology. The company also received the Frost & Sullivan Award for its brand development strategy leadership in the conjugated linoleic acid market. Cognis Nutrition & Health named Sharrann Simmons as senior marketing manager.

■ RQA Inc. announced the addition of Pamela Vaillancourt as the vice president, Business Development for its Product Dynamics Division.

■ David Michael & Co. announced the opening of the new David Michael de Mexico SA de CV facility in Lerma, Estado de Mexico. In addition, Erica Byerly joined David Michael & Co. as a consumer research specialist. Kelly DeFusco joined the company's Applications Lab as project leader—bakery cereal. David Michael & Co. also welcomed Laura Ennis as a senior beverage innovation technologist. Michele Pittner joined the company's Purchasing Department.

■ Main Street Ingredients added two account managers: Aaron Jordi and Rita Gostonczik joined the Food Ingredient Group.

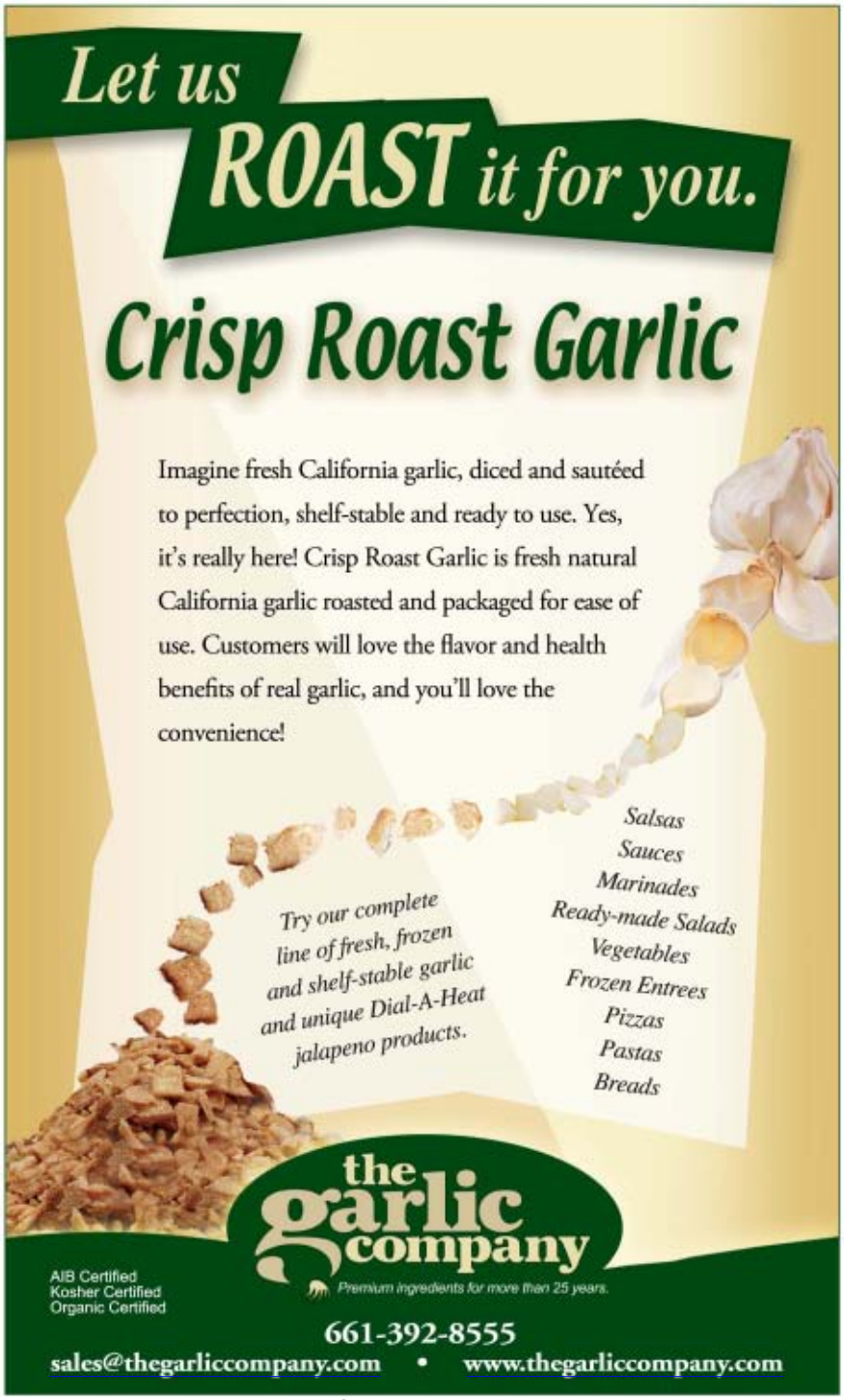
■ Grain Processing Corporation promoted Celeste Sullivan to technical manager, Food Applications.

■ Solae completed the acquisition of Cargill's isolated soy protein (ISP) Prolisse product line including the patented membrane technology for processing ISP. Financial terms were not disclosed.

■ LycoRed Ltd., Israel, named Michael Doyle as president of U.S. division.

■ Cafosa launched a new website at www.cafosa.com.

■ Donald Coffey has been appointed vice president of innovation at MGP Ingredients Inc. (MGPI). The company also announced the appointment of Scott Phillips as general manager of extrusion technology and named Quinten Stewart corporate director of purchasing.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Melamine Risk Assessment

Mark S. Hostetler, Blackwell Sanders LLP

FDA and FSIS have completed and announced what the agencies are calling an "interim safety/risk assessment" on meat products from hogs and chickens which have been fed food scraps contaminated with melamine. FDA finds no risk to humans, and FSIS concludes that it will continue to inspect and stamp pork and poultry products from animals consuming possibly contaminated feed.

The assessment relies on certain assumptions and calculations: That melamine is metabolically inactive and is eliminated as melamine; that three melamine analogues share an equal potency; and that melamine is unlikely to accumulate over time in edible tissues of animals. FDA calculated its exposure estimates, including a substantial safety factor on the analytical limit of detection for melamine of 50 parts per billion (ppb), and then doubled it to account for the possible presence of one of the three analogues which is not measured by the test (cyanuric acid). FDA calculated daily intake estimates using three different eating plans:

1. Consumed as catfish, chicken, eggs and pork (100ppb) = a mean of seven micrograms per person per day; and 14 micrograms per person per day at the 90th percentile.

2. Consumed as chicken, pork and by-products (100ppb) = a mean of two micrograms per person per day; and six micrograms per person per day at the 90th percentile.

3. Consumed in all solid food (100ppb) = 150 micrograms per person per day.

No Observable effect level of 63mg/kg/day times a safety factor of 100 yielding a Tolerable Daily Intake of 0.63.

The highest exposure(s) estimated using the FDA's assumptions and calculations was found to be as much as 200 times below the Tolerable Daily Intake.

FDA concluded that the consumption of meat products from animals whose feed was contaminated with melamine is "unlikely to pose a human health risk."

While noting that the food products contaminated with any level of melamine could be considered adulterated under its statutes, FSIS states, "(b)ased on the results of the measured melamine concentrations in pork and poultry tissue samples from animals exposed to adulterated feed, together with the findings of the interim safety/risk assessment, FSIS had determined that it is able to find that pork and poultry products from animals that have consumed feed that contain pet food scraps contaminated with melamine and melamine-related compounds are 'not adulterated' and thus eligible to receive the mark of inspection under the FMIA and PPIA."

Imported Food Safety

President Bush has signed an Executive Order "Establishing An Interagency Working Group on Import Safety." The 13 member group, plus employees and staff, will be known as the "Working Group" and is charged with "(identifying) actions and appropriate steps... within existing resources, to promote the safety of imported products..."

Means at the disposal of the Working Group include: reviewing current procedures to ensure the safety of imported products; identifying means to enhance the safety of imported products; and using all available resources to safeguard the imported food supply. Recommendations are due to the president within 60 days, unless it is determined that additional time is necessary.

Two bills were introduced with the stated goal of improving the safety of imported food: the Assured Food Safety Act of 2007 (H.R. 2997) and the Imported Food Security Act of 2007 (S. 1776).

H.R. 2997, the Assured Food Safety Act of 2007 (foods under the jurisdiction of either the FDA or the USDA), establishes a program for requiring all foods imported into the U.S. be accompanied by "a certificate of assured safety" issued by the government from which the import originated. The bill also requires that within one year a study be completed to assess "the minimum amount of inspection necessary to assure consumers of a safe food supply." The program will be paid for by user fees.

S. 1776, the Imported Food Security Act of 2007 (foods under FDA jurisdiction only), would provide that funds collected through a user fee system be used for developing techniques for food safety inspections of imported food, requiring that FDA establish a certification system for foreign governments and establishments seeking to import food to the U.S. that is comparable to U.S. standards for food safety, labeling and inspection.

Additional food safety import legislation is expected from Rep. John Dingell (D-Mich.).

The risk assessment on melamine seeks comment from the public. The interim assessment is available at http://www.cfsan.fda.gov/~dms/melamra.html.

Mark Hostetler is an attorney at Blackwell Sanders LLP. Experienced in advising consumer product companies and focusing primarily in the food industry, he has guided producers, advertisers and marketers through regulatory proceedings, product recalls, new product introductions, and new advertising and promotional campaigns. He can be reached at mhostetler@blackwellsanders.com.

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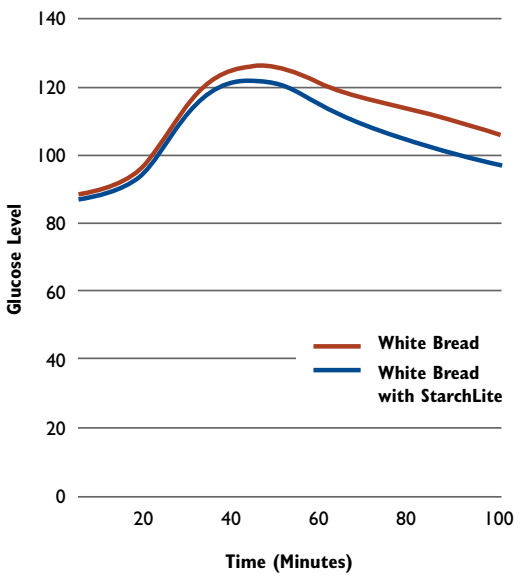

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Beneficial Support

New research offers ingredient insights into commercial opportunities for the design of nutritionals.

Kerry Hughes, R&D Applications Editor

A dietary supplement including orange peel is "set to storm the market" of cholesterol-reducing products, while apple extract is found to improve physical fatigue.

PHOTO COURTESY OF ISTOCKPHOTO/CHRISTINE BALDERAS

These days, only those skilled in the art and science of nutrition seem to realize how many positive studies on dietary supplements and nutraceuticals have been published in recent years. There has been a veritable avalanche citing nutritional benefits of certain foods, nutrients and herbs. This stands in contrast to the negative information that frequently emanates from the mainstream press. What puzzles many in the nutrition industry is the speed with which public opinion can be turned by the findings of just one study.

One of the most recent and shocking of these studies told of increased prostate cancer rates related to heavy multivitamin use[1]. Although the authors pointed out several biases of the research, the press ignored these caveats and printed sweeping headlines stating that multivitamin use caused cancer. An ensuing study claimed that people who ate a diet rich in B vitamins could cut their risk of pancreatic cancer—except for those people who got their B vitamins from supplements; it was suggested the latter group has a 139% increased risk of developing the disease[2]. The researchers in the second study did state it was preliminary, but suggested that, in combination with other results, there was the possibility of an increased risk of cancer associated with supplement use. They stated this because "if a person did not take in enough of these nutrients consistently through diet and then suddenly started taking multivitamins in an effort to become healthy" that it might "fuel pancreatic cancer growth." Again, the bias that participants in these studies might be at a greater risk of developing the disease because of their previous diets (and, consequently, were at a greater risk of mortality) was absent from the headlines.

The recent treatment of supplements as potential dangers is quite different from the time when the media was quick to tout them as a cure for all sorts of illnesses, without the support of strong scientific research. The recent wave of suspicion against supplements coincided with the first large epidemiological studies that linked beta-carotene to reduced cancer risk if taken in food form and to increased risk if taken in supplement form. Although a few studies confirmed that supplemental purified beta-carotene was to blame, there was little effort made to distinguish these effects from other mixed carotenoid supplemental sources of beta-carotene. Another carotenoid that has received much positive attention, especially for reducing the risk of prostate and cervical cancers, is lycopene. Yet again, after several studies showing positive benefits for preventing prostate cancer, a study released this year concluded that blood lycopene levels were found to have no effect on prostate cancers, and this has received widespread media attention[3].

This negative trend in the popular media and in some scientific reports also impacts trade statistics. The market for nutritional supplements totaled $4.7 billion in 2006, up only 1% over previous years' sales, according to Packaged Facts, a publishing division of MarketResearch.com, in

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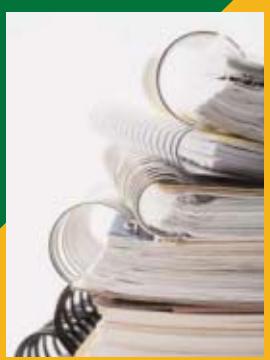

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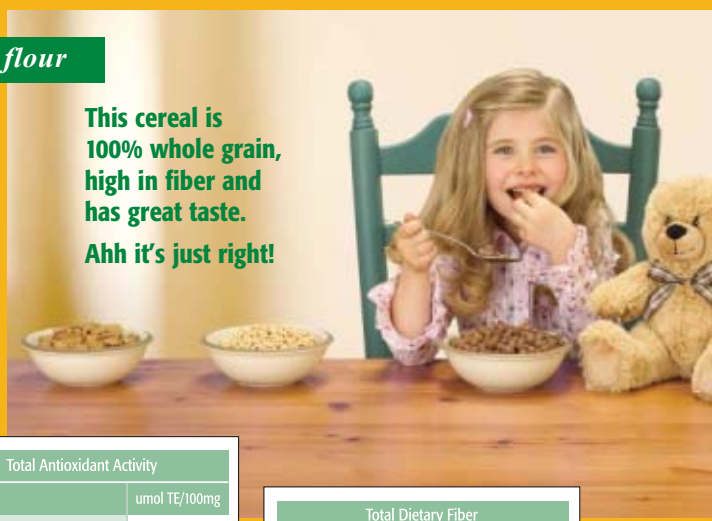

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Researchers suggest that eating food or drinks made from cacao beans, including dark chocolate, might help prevent the onset of type 2 diabetes.

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its report titled "Nutritional Supplements" (November 2006). According to the report, "The main reason for this lackluster performance is the recent spate of negative media reports regarding nutritional supplements, which have dampened consumer confidence in the products even as functional foods continue to attract a wider following." The report identified a new focus on condition-specific supplements as an area that can help the nutritional supplement market rebound and predicted that the market for supplements will improve through 2011. Much growth will be due to targeting specific conditions of concern to Baby Boomers. Likewise, they see the use of more functional food ingredients (like cranberry and pomegranate) and food-like delivery systems pushing supplement sales. Packaged Facts predicts that consumer confidence will return as positive reports emerge to contradict negative claims.

Recent research suggests some opportunity with such condition-specific areas as:

■ Diabetes and Insulin Sensitivity

Chocolate lovers rejoice! There has been more good news about chocolate this year, including the claim that cacao liquor proanthocyanidins may prevent elevation of blood glucose in diabetic, obese mice. The researchers suggested that dietary intake of food or drinks made from cacao beans might help prevent the onset of type 2 diabetes[4]. Additionally, the consumption of magnesium-rich products, especially whole grains, was found to cut the risk of type 2 diabetes by 35% in African-American women[5].

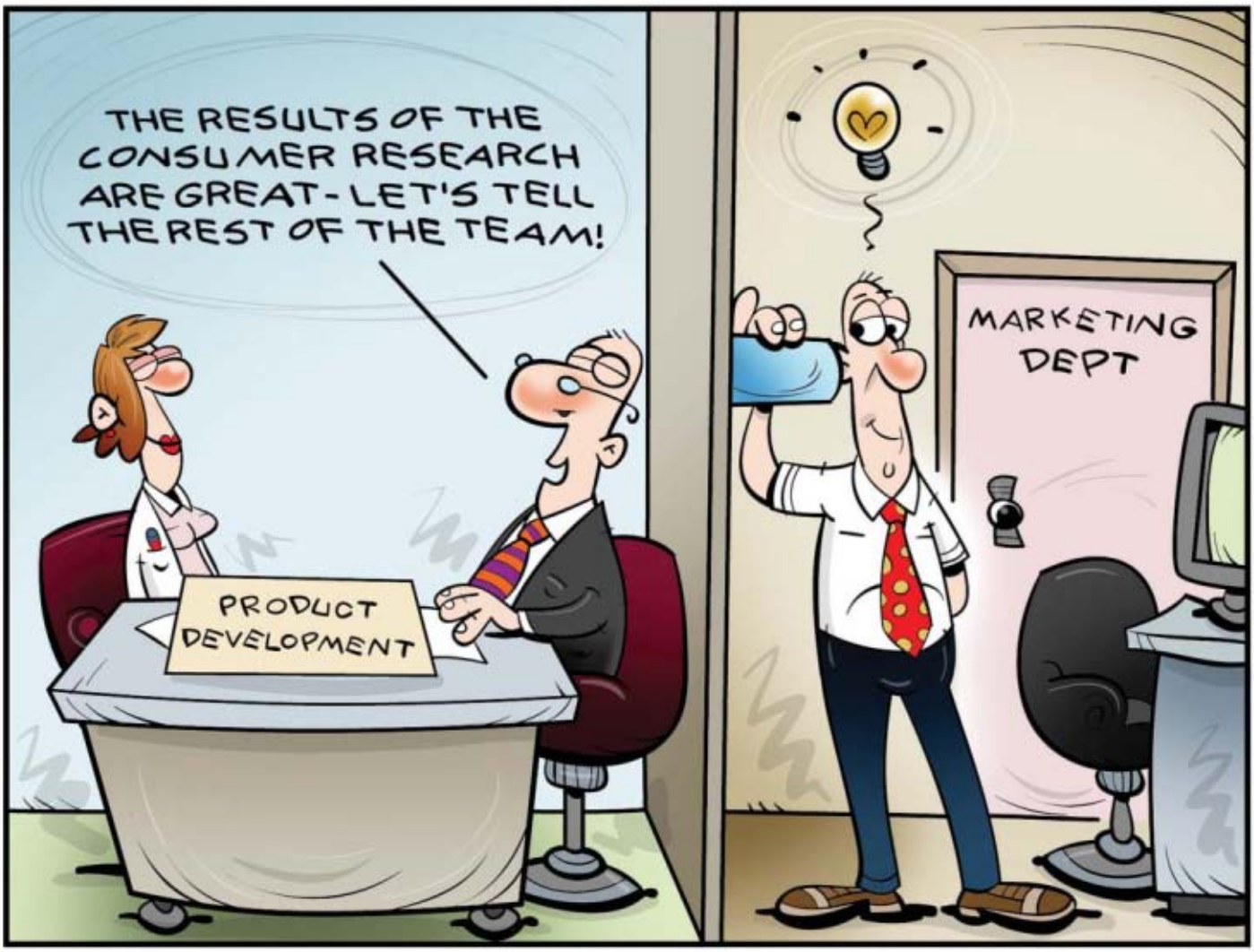
■ Weight Control

Chocolate fanatics are not the only ones getting good news. Red wine drinkers also have something to sing about, as one finding on the benefits of resveratrol, the phenolic derivative found in red wine and some plants, was described as "the breakthrough of the year." Resveratrol fed to mice on high-calorie diets was found to protect the mice from the negative effects of their debaucherous behavior. A month later, another group of researchers found that mice fed resveratrol were found to be protected against diabetes and obesity[6,7].

Findings that show that small nutritional compounds could have such an effect on the outcomes of obesity are important at a time when more pressure is being put on the food industry to cope with this growing epidemic. Although the correlation between obesity and certain types of cancer had already been known, in 2006 it was found that obesity was linked to more aggressive tumor types in people with ovarian cancer (as well as a bleaker prognosis)[8].

Research that links certain healthy foods to lowering obesity has also been accumulating. For example, a hand-

In a model that induced dementia in rats, both strawberry and blueberry extracts were found to provide protective effects.



Consumers say they prefer sweetened dried cranberries over other dried fruits

Independent consumer research reveals that 74% of consumers would try a new trail mix, 67% would be proud to serve a new trail mix and 70% would try a new granola or cereal bar if they contained sweetened dried cranberries (SDCs). Consumers have ranked SDCs higher than any other dried fruit in terms of health, color, sophisticated image, unique flavor and low calorie content.

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Resveratrol, found in red wine, has been found to protect against diabetes and obesity.

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ful of almonds rich in flavonoids, antioxidants, vitamin E and magnesium may be able to induce a feeling of satiety and help aid people in managing their weight[9]. Likewise, a new meta-analysis has revealed that conjugated linoleic acid (CLA), a dairy component, has a modest effect in reducing body fat (at the dose of 3.2g/day)[10].

■ Cholesterol Control

According to a 2007 report by Frost & Sullivan entitled "New Excitement in the Natural Cholesterol Reducing Products Market," a dietary supplement that is a proprietary combination of polymethoxylated flavones from orange peel and *Phellodendron amurense* extract is "set to storm the market." When compared to other cholesterol-reducing products on the market, the new combination is said to have a different mechanism of action than statin drugs and might be a good complementary strategy for prescription drug users.

• Enhanced Energy and/or Sports Products

In a double-blind, placebo-controlled, three-way crossover trial, apple extract was found for the first time to improve physical fatigue[11]. The branded apple extract (1,200mg/day) was given for eight days and found to improve physical performance on a bicycle ergometer with fatigue-inducing workload trials.

■ Eye Health

People who eat at least two servings of fish per week have been found to be less likely to develop age-related macular degeneration (AMD). Subjects with diets high in omega-3 fatty acids, coming predominantly from tuna, salmon or other oily fish, were close to 40% less likely to have AMD than those who ate little omega-3[12].

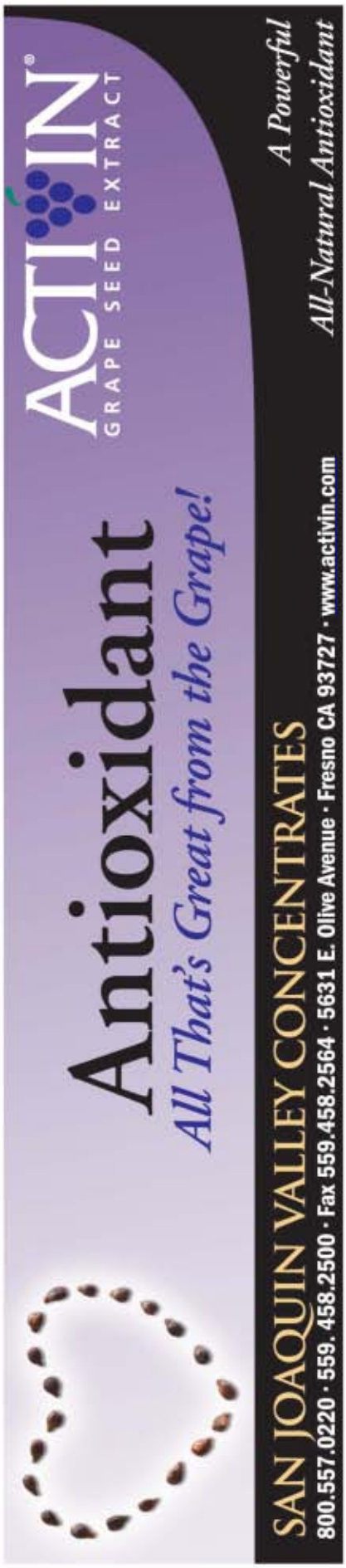
■ Digestive Health

Last year, at a research conference sponsored by an oligosaccharide supplier, the co-chair of the event was quoted as saying, "Prebiotics potentially may be more relevant [for health] than probiotics." Key health benefits of prebiotics that have been studied are bone health and colorectal cancer prevention.

However, new research unveiled last year showed that natural resistant starch may be delivering health benefits through a previously overlooked mechanism. Although energy dilution and bulking were thought to be the main theories explaining fiber's benefits, the new research shows fermentation has a greater impact on cellular metabolism and fat deposition than the other theories[13].

■ Bone Health

Results of a recent study on the mounting effects of prebiotics on improved bone health found that supplementation of the diet with the soluble fibers inulin and oligofruc-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Although the media coverage on benefits or dangers of supplements seems to change almost overnight, daily fish oil supplementation has been found to reduce anger levels and balance other mood states.

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tose boosts calcium absorption in rats by 40%. Better calcium absorption was also shown in adolescent girls and postmenopausal women in a previous study[14]. It is thought that these studies will open up whole new areas of research[15].

One of the areas that alternative medicine proponents have been talking about for literally decades is the acid/base balance of the diet and its implications upon wellness and bone health. Recent research demonstrated for the first time that by just partially reversing the acidity of the diet, bone mass increased to a degree previously found when induced by pharmaceuticals. This research may open up new avenues of research into the benefits of lowering the high acidity of the modern diet[16].

Although accepted as an important nutrient in the prevention of osteoporosis, vitamin D's role in these benefits has been largely unknown. However, a recent study found that orally administered vitamin D inhibited the production of a protein called c-Fos, a key factor in the development of the cells that degrade and reabsorb bone (thereby tipping the quotient to more bone formation)[17]. This study is one of several that has increased public awareness of the vitamin and spurred sales in the U.K. One of these studies reviewed the evidence of what constituted the best source of vitamin D. It was recommended that with the high rates of skin cancer, the U.K. researchers' proposal to get vitamin D through 10 to15 minutes of unprotected sun exposure in the middle of the day was "highly irresponsible." As a result, taking supplements and the diet were concluded as being more responsible and still effective[18].

Mood and Cognitive Health

Daily fish oil supplementation has been found to reduce anger levels as well as balance other mood states, such as anxiety and the tendency towards aggressive behavior. A new study adds to the mounting clinical evidence that low levels of omega-3 oils, particularly EPA and DHA, contribute to anger and anxiety and depressive, suicidal and aggressive behaviors[19]. Omega-3 fatty acids, especially DHA, have also been found recently to potentially lower the risk of dementia and Alzheimer's disease[20].

According to a study on the benefits of the Mediterranean-style diet, the risk of Alzheimer's disease may also be cut 68% though adherence to the diet[21]. The researchers theorized that the Mediterranean diet could be "capturing the composite effect of dietary antioxidants." In another study, drinking three glasses of fruit or vegetable juice a week was found to potentially cut the risk of Alzheimer's disease by 75%[22]. This research also points out that it is not the antioxidant vitamins (C, E and beta-carotene), but the antioxidant polyphenols that contribute the benefits. Another recent study showing similar results for the reduction of Alzheimer's disease by antioxidant polyphenols showed pomegranate juice could halve the build-up of proteins in the brain that are linked to the development of Alzheimer's[23].

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One study found drinking three glasses of fruit or vegetable juice a week potentially cut the risk of Alzheimer's disease by 75%.

PHOTO COURTESY OF ISTOCKPHOTOS/JOSE ANTONIO NICOLI ANDONIE

In a model that induced dementia in rats—by replicating the normal process of aging through radiation exposure—both strawberry and blueberry extracts were found to provide protection from the effects of radiation (or aging) on brain function. The rats were fed berry extracts for eight weeks prior to the radiation exposure. The researchers noted that this was not the first evidence linking blueberries to protection from dementia and Alzheimer's[24].

Green tea extract (EGCG, specifically) has been found to potentially slow the progression of Huntington's disease, a disease that is characterized by neurotoxicity, due to an accumulation of mutated proteins in people who have the genetic propensity to the disease. This research adds to the growing body of evidence on the health benefits for green tea, including lowering the risk of certain cancers, increasing weight loss and protecting against Alzheimer's[25].

This year, a large-scale clinical trial is being launched by the National Institute of Neurological Disorders and Stroke to assess if creatine can slow the progression of Parkinson's disease. If the results are positive, this study could spell new formulation and marketing opportunities for creatine.

Looking Forward

As can be seen even in the sampling of scientific and media reports about condition-specific news on supplements, the overlap between supplements and functional foods is increasing. Just as food companies are developing more products geared toward functional foods, supplement companies are expected to be developing more "food like" products such as powdered or extract versions of green tea and pomegranate. Consumers also will see additional food-based polyphenol antioxidant sources, such as berries, CLA, apple and citrus extracts, omega-3 fatty acid sources and even wine and chocolate. NS

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NUTRA Solutions

Clinical research studies are complex endeavors that are impacted by many outside factors. These include failure to adequately take into consideration the diets of participants or to consider compliance rates when a specific substance is to be consumed daily.

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Building Healthy Kids

As parents get their kids ready to go back to school, GTC Nutrition reminds them that kids need to build more than their mind to lead a healthy life. Parents should offer snacks that are rich in calcium and contain prebiotics. Many bone-healthy foods enhanced with NutraFlora prebiotic fiber, such as Horizon Organic yogurts and smoothies, can be served as a snack on their own or incorporated into easy and fun after-school snack recipes that will help kids build strong bones. See nutraflora.com for recipes. GTC Nutrition, Trina O'Brien, 303-468-5077, tobrien@gtcnutrition.com

Fat Loss Not Weight Loss

A press briefing was held during the 2007 IFT Expo in which Georgetown University physician and scientist Harry Preuss, M.D., discussed the various aspects in the evaluation of clinical studies on compounds for weight management. One should ask, for example, whether the right amount and right form of a substance under consideration was used. Secondly, was overall weight or fat lost? Compliance is another consideration; how many actually took the compound as instructed? Several studies support the weight management benefits of Super CitriMax®, a highly soluble form of (-)-hydroxycitric acid bound to calcium and potassium provided by InterHealth Nutraceuticals Inc. 707-751-2800, www.InterHealthUSA.com

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Coffee May Help Women's Memories

Bloomberg News reports that a study in *Neurology* found that daily consumption of four or more cups of coffee by women 65 and over resulted in 30% of them less likely to fail recalling words from memory—when compared with those who had lower consumption levels. For those 80 and over, heavy coffee drinkers were 70% less likely to show memory loss on tests. Drinking fewer than two cups per day offered "no significant protective effect at all," according to the researchers. *—From the August 13, 2007,* Prepared Foods *e-Flash; scroll down the right hand side of www.PreparedFoods.com to sign up.*

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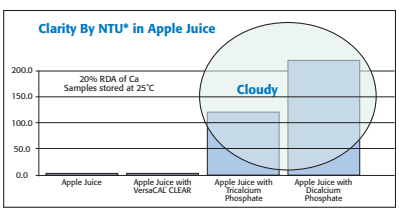

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Winning Women with Almonds

A passion for almonds unifies more than 40 million American women. In the Almond Board of California's new report on food attitudes and behaviors of these women, it was found that nearly 80% said lowering the risk of heart disease is a very important benefit when choosing foods to eat. They are health-oriented, food-involved, convenience-seeking consumers, with 62% agreeing that almonds blend together great taste and nutrition in a wonderful way. Almond Board of California, Harbinder Maan, 209-549-8262, info@almondboard.com, www.almondsarein.com NS

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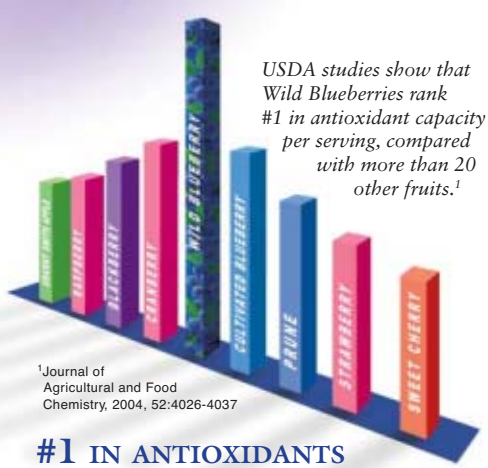

USDA studies show that Wild Blueberries rank #1 in antioxidant capacity per serving, compared with more than 20 other fruits.[1]

[1]Journal of Agricultural and Food Chemistry, 2004, 52:4026-4037

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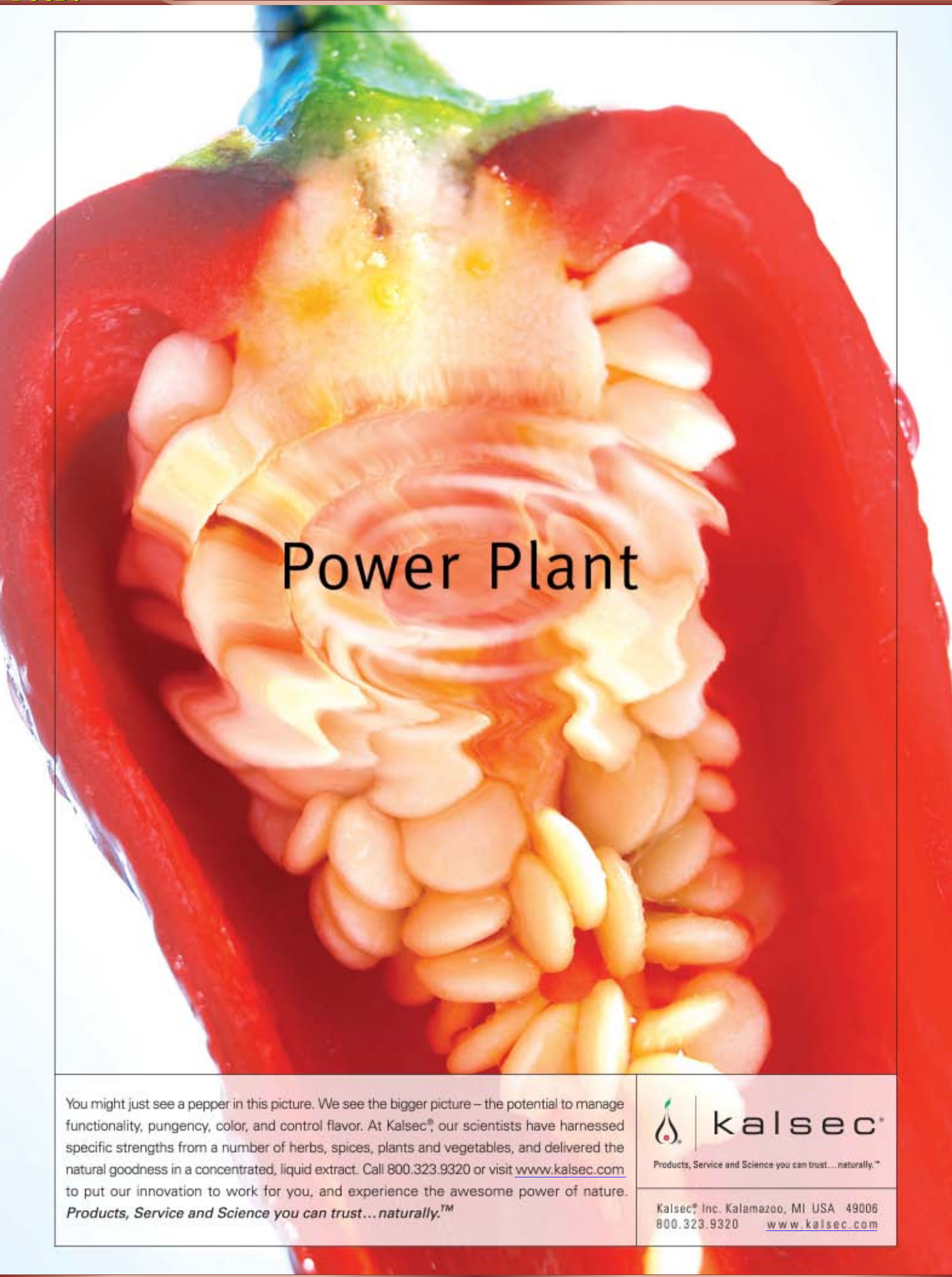

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A New Generation of Batters and Breadings

Breadings and batters have the power to make or break a food product. As consumers look for ways to add flavor to favorite foods without adding fat and calories, breading and batter formulators continue to redefine food coating systems to meet those needs.

Tom Zind, Contributing Editor

PHOTO COURTESY OF KRAFT FOOD INGREDIENTS

Now more than ever, batters and breadings have as much power to make or break a food product as any food ingredient. Conveying flavor, mouthfeel and eye appeal on one hand, and packing fat and calories on the other, they can be responsible for single-handedly changing the very character of many foods.

In recognition of these facts, food companies and coatings suppliers are revisiting this once-sleepy ingredients category and concocting new and different formulations to be more in step with the times.

Startled to action partly by the low-carb craze that saw some weight-conscious consumers spurn grains-based foods and partly by the obesity epidemic and healthier diet trends, the industry is in the process of turning adversity into opportunity by reformulating, redesigning and, in a very real sense, redefining food coatings systems. The result is an emerging generation of new and enhanced breading/batter/coatings systems friendlier to both processors and consumers.

Changes in breadings and batters take many forms; one of the most prevalent is the makeup of the mixture.

Breading for retail products needs to be ovenable and microwaveable, yet still deliver "wow" flavor and texture.

New-generation breadings, for example, incorporate everything from grain type (whole, gluten-free, natural/organic and exotic) to subtly different crumb sizes and textures. Mixtures formulated to produce a more acceptable microwavable product are also desirable.

Whole-grain Interest Grows

"We're seeing a real trend to the use of more whole-grain breadings and batters," says Ron Pottinger, vice president of research and development with a coatings supplier. "Big poultry processors like Tyson helped initiate the move, and that has caused others to look at it and inquire as to whether their breadings can be converted to a whole-grains makeup."

Driven chiefly by more interest everywhere in whole grains, such breadings are seen as a way to make a clear appeal to the health concerns of growing legions of whole

grains devotees. Plus, they may offer a way to give many maligned breaded foods a healthier halo; Pottinger cites the fact that some corn dog nugget makers are making the switch to whole-grain coatings.

From a functionality standpoint, whole grains pose some different challenges and opportunities in processing. Pottinger notes whole grains are ideal for use in breaded products designed to be baked rather than fried. With more baked protein applications emerging, whole-grain coatings might be beneficial. Additionally, Pottinger says, using whole grains reduces the need for coloring agents typically used in breadings made from more highly processed grains. However, pricier whole grains also add to ingredient costs.

Specialty breadings that may employ a mixture of gluten-free whole grains such as flax, oats or millet pose a challenge as well. Limited availability means they are generally more costly. Additionally, such grains also produce breadings that, when cooked, yield an appearance and texture possibly foreign to the average consumer.

While steadily emerging, whole and non-wheat-based breadings remain largely on the industry's fringes, but changes also are taking place in breadings made from traditional ingredient sources. A driving force is the demand for healthier, less-fattening breaded and battered foods which achieve that status either through baking or frying processes where cooking oil absorption is minimized.

Processors and coatings suppliers have worked to develop systems which deliver a mouthfeel and flavor in ovenable and microwavable products similar to that in fried versions. Meanwhile, products still designed to be fried increasingly employ breadings and batters designed to work in more challenging trans fat-free, par- and finish-fry applications adopted by more processors.

Some frozen fish manufacturers are looking to inclusion coatings that incorporate herbs, spices and texture agents to deliver flavor through the batter or breading.

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Fish, chicken and other proteins still account for most of the market's breaded and battered products, but novel formulations including whole-grain coatings or different crumb sizes/textures are being introduced.

Dealing with New Realities

These and other demands are sending many coatings suppliers back to the drawing board to devise systems that can handle multiple duties. A new approach is needed, says a vice president of marketing for a leading supplier, because coated products are increasingly prepared and handled in ways that many traditional coatings systems were not designed to address.

"Retail products increasingly have to be ovenable or microwavable, and they still need to deliver 'wow' flavors and textures. In foodservice, you need to have all-purpose coatings that can be used with multiple products and which won't allow flavors to leak out into the cooking oil vessel in which multiple items are prepared," says executive George Manak. "Another challenge in foodservice is the need for coatings that will hold their texture for extended hold times. That's become more of an issue, as casual dining restaurants handle more take-out orders from customers."

Manak's company has responded by trying to change the breading mixture to be fundamentally more functional. The approach, for which the company is seeking a process patent, builds on the industry standard Japanese crumb, American crumb or crackermeal breading. "We're trying to make something that's more physically robust that will hold up in a manufacturing environment or in the back of a restaurant," he says. "The goal is to have a more functional crumb that will replicate the flavor and texture of breaded foods prepared in a fryer in both oven and microwave cooking applications."

Earlier this year, Pilgrim's Pride Corporation unveiled a line of chicken products that utilize a new breading formulation. The breadings allow EatWellStayHealthy Kids™ Breaded Chicken Breast Nuggets and Breaded Popcorn Chicken to be baked (rather than fried) and, in the process, deliver chicken with sharply reduced fat, sodium, calorie and carbohydrate counts that qualify them for the USDA's "healthy" designation and the American Heart Association's "heart check mark" seal of approval.

"The key was dialing in the breading formula," says Dan Emery, the company's vice president of marketing. "Getting the

PHOTO COURTESY OF HYDROBLEND INC.

Batters and breadings can be customized to create products meeting today's food trends. Seasonings, colorings and even the bread-crumb style, such as American or Japanese-style, also can be adjusted. Some processors are now interested in using whole-grain cereals to make a healthier product.

sodium content down to a reasonable level was a big key, as was getting a batter and breading mix that would work with a baking process. We had to work to get the texture and the adhesion right, in addition to ensuring that it would pass the taste test."

Coatings as Flavor Carriers

The latter consideration is clearly a top priority for coatings suppliers and food processors. Even as breadings and batters become more functional, they continue to be retooled to pack more robust flavors. Systems that employ marinades, starch predusts that aid adhesion, encapsulated spices that dissolve in the cooking process and coatings engineered to prevent flash-off in the fryer are getting more attention as the demand for full, authentic flavor grows.

Gorton's, maker of frozen seafood products, is looking to batters and breadings to shoulder much of the load in delivering more flavorful products to market. Coatings are so vital to the company's products that it relies on its own specialty products division to formulate batters and breadings for products ranging from pollock to tilapia to shrimp.

"It takes great flavor, appearance and texture to sell our products, and coatings play a central role," says Donald Lynch, the company's vice president of research and development and quality assurance. "Inclusion coatings that incorporate herbs, spices and texture agents to deliver flavor and a visible reinforcement of those flavors are important."

Lynch says one of the newest coatings initiatives is a line of "authentic" coatings. A prime example is the company's Beer Batter Fish Fillets that employ a flour-and-starch batter made with real beer. The company's lemon pepper fish fillets employ inclusion coatings, while a frozen pollock product sports a new potato crunch breading that mimics the flavor and aroma of potato chips.

While improved and enhanced coatings breathe new life into these and other products, they also open the door to new food applications. Fish, chicken and other proteins still account for the lion's share of the market's breaded and battered products, but more vegetable, cheese and meat substitute products are being introduced to coatings.

A look at Houston-based foodservice distributor SYSCO Corporation's lineup of breaded and battered products shows how the roster of coated products is expanding. Cauliflower, broccoli, zucchini, okra, onions, squash, mushrooms, pickles and even sweet corn are available in a variety of special breading and batter formulations. Vegetable applications, in particular, are testing the formulation skills of coatings suppliers because of the moisture migration challenges inherent in products with a high water content.

So far, however, such hurdles have not kept food processors and their coatings suppliers out of the test lab in search of ways to add a host of unique values to food products. As consumers look for novel, but healthy, methods of increasing flavor and mouthfeel in their favorite foods, the quest for new ways to bread, batter and otherwise coat foods is likely to continue. Pf

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See Food Master-*INGREDIENTS*, p. 14

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On the National Menu

Maria Caranfa, Mintel

PHOTO COURTESY OF ISTOCKPHOTO

Tempura: The New Way to Fry

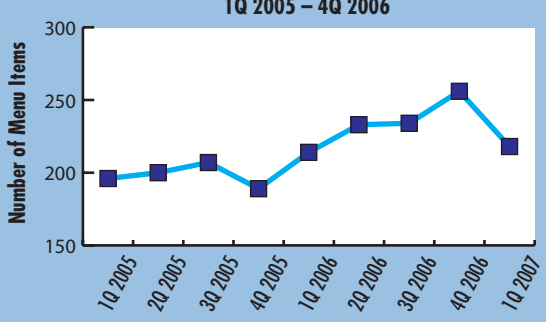
Tempura is a preparation of battering and frying foods that results in a light, crispy, pillowy texture. Originating in Portugal, tempura is most commonly associated with Asian—specifically Japanese—cuisine and flavors.

Tempura is the new way to fry. According to Mintel Menu Insights, tempura preparation increased 77% across U.S. restaurant menus over the past two years. Independent restaurants served the highest number of tempura-fried foods, but chain restaurants are quickly picking up on the trend. The most popular tempura dish is fried seafood or vegetables, usually served with a dipping sauce. One simple example is Palatte Restaurant & Bar's Tiger Prawn Tempura, with light soy and lime chipotle aioli.

Restaurants are incorporating tempura-fried ingredients into popular menu items. This fashionable preparation is being used in both traditional and contemporary ways. Dingbats created a Strawberry Crunch Chicken Salad with tempura-fried chicken breast, spinach, honey-nut clusters, strawberries, mandarin oranges, gorgonzola cheese, red onions, bacon and sweet-and-sour dressing. Fleming's Steakhouse fries Lobster Tempura with red jalapeño pepper and soy-ginger sauces. Plus, for the ultimate dessert experience, there is the Tempura Cheesecake at Rangetsu of Tokyo.

Taking Tempura

Incidence of Menu Items Using the Tempura Preparation, 1Q 2005 – 4Q 2006



Source: Mintel Menu Insights

Say Cheese!

PHOTO COURTESY OF ISTOCKPHOTO/GREG NICHOLAS

Cheesecake, the ultra-popular cream cheese dessert, is the menu staple that brought attention to cheese on the dessert menu. According to Mintel Menu Insights, cheesecake is the third most popular dessert on the menu. Because of its popularity and versatility, the dessert is expanding past the ordinary. Mesa Grill created rich cream cheese ice cream to complement its Warm Guava Crêpes. Magnolia's Restaurant uses cream cheese in a more traditional manner in its Warm Cream Cheese Fudge Pecan Brownie with chocolate ice cream, cinnamon-caramel sauce and fudge sauce.

The popularity of cream cheese as a dessert ingredient paved the way for mild and bold cheeses to make their way into after-dinner indulgences. According to Mintel Menu Insights, goat, mascarpone, ricotta and bleu cheeses can now be found in sweet desserts. Fine dining restaurants have been the first to experiment with bold cheeses. Blue Ginger created Goat Cheese Mascarpone Sorbet. Janos displays goat cheese on cheesecake and has created a dessert combination of port-poached pear, *chèvre* cheesecake and warm St. Andre cheese. Rialto Restaurant blends a Gorgonzola Mousse with quince jam on phyllo crisps with walnuts, figs and honey.

Sweet Finish

Top 10 Desserts on the Menu, 4Q 2006

Dish	Number of Menu Items
Ice cream	148
Chocolate cake	136
Cheesecake	121
Sundae	100
Brownie	74
Crème brulee	72
Cookie	67
Apple pie	59
Tiramisu	53
Sorbet	46

Source: Mintel Menu Insights

For more information, visit www.menuinsights.com or contact Mintel International at 312-932-0600. Mintel Menu Insights tracks menu trends and innovations from the 350 largest chain restaurants and 150 independent restaurants, also featuring the nation's top 50 chefs.

Energizing Ingredient Trends

***Prepared Foods'* "2007 R&D Trends Survey: Functional Foods" looks at emerging nutritional ingredient trends in health foods, beverages and nutraceuticals, with a special focus on energy products and GRAS ingredients.**

Claudia D. O'Donnell, Chief Editor

Elements that influence a new product launch, or even a new company, are varied. They range from recognition of consumer needs to a "Eureka!" idea that initiates a new business concept. For Alex Hughes, M.D., co-founder of Redondo Beach, Calif.-based Function Drinks, the seed of inspiration for a new product line was an observation made in a hospital.

"I was amazed at some of the things that we used that were powerful, natural supplements," says Hughes, an orthopedic surgeon at the UCLA Medical Center. "One example is N-acetyl-L-cysteine (NAC), one of the most potent antioxidants known." The compound is used for protection of lungs, kidneys and other organs during surgery, chemotherapy and radiation therapy.

What could have been a blue-sky idea for a new business launch was tempered by awareness of business realities. "A good friend's father was a co-founder of SoBe. I was familiar with some of the business aspects of starting up a beverage company," Hughes says.

The ingredient NAC eventually found its way into the company's Urban Detox, House Call and Brainiac products. The latter, formulated to assist memory, mental clarity and mood, also contains vitamin E and zinc as well as ginkgo biloba and soy phosphatidylserine. Hughes notes that he and co-founder Josh Simon initially struggled with taste parameters and turned to a flavor house to help develop their product line.

When asked how the products and ingredients were chosen, Hughes replies that although they are in "fun formats," they had to be truly innovative, founded on science and, most importantly, relevant to the company's southern California customers (although the company hopes to be in all major U.S. markets by the end of 2007). While some products in the line are in unique niches, others are in very competitive arenas. Function Drinks' Alternative Energy, a low-carbohydrate product, is a case in point.

The science behind the product, however, is detailed more than most. Its website notes, "Thanks to the propri-

What Makes it an Energy Product?

Formulation and/or Characteristic	% Say It is Important
Products developed for "sustained energy release;" that is, those that do not spike blood insulin levels.	63
The presence of specialty ingredients to enhance energy metabolism (e.g., carnitine to transport lipids or chromium to transport glucose into cells).	49
The presence of stimulants such as caffeine, theobromine, guarana, tea, etc.	47
The presence of high amounts of quickly utilized energy sources such as glucose, sucrose, digestible maltodextrins and starches.	44
Any product developed for "snacking" (e.g., for in-between-meal boosts).	30
The presence of calorie-providing components such as fats, carbohydrates or proteins.	28
Other	3

Source: "2007 *Prepared Foods*' R&D Trends Survey: Functional Foods"; base: n=229

etary ingredients and the special pharmacokinetics (or metabolism) of Function Alternative Energy, you avoid the harsh take-off and landing associated with traditional synthetic energy drinks." Certain plant extracts were included for their ability to provide "energy, stamina and alertness." Also included is a full complement of the B complex vitamins—zinc and vitamin C—that "play a role in energy source mobilization within the body."

The product's efforts to deliver consistent energy is also in harmony with what was reported to be the most important aspect of an energy product, according to the 2007 *Prepared Foods*' "R&D Trends Survey: Functional Foods."

An Energetic Category

The U.S. energy drink category checked in with $3.7 billion in sales for 52 weeks ending July 15, 2007, according to Information Resources Inc., a Chicago-based research firm. This figure includes sales from supermarkets, drugstores, convenience stores and mass merchandise outlets (excluding Wal-Mart). Using Mintel's Global New Products Database (GNPD) to search for new foods, beverages and dietary supplements with the word "energy" in their description during the January 2006 to July 2007 time period, some 893 new products can be found. "It currently is one of the hottest categories in the functional foods category," states Lynn Dornblaser, director, GNPD Consulting Services, Mintel International. Although consumer interest in products that stave away "tiredness" and increase stamina may be central to their popularity, the concept of "energy" has also traditionally played a role in weight management.

When asked which formulation or product characteristics were important to a food or drink in order for it to be promoted as an "energy" product, 63% of respondents noted that it should deliver "sustained energy;" that is, not spike insulin levels. Multiple responses were allowed.

For example, in 2004, the IFIC (International Food Information Council) Foundation, as part of a public-private partnership called the Dietary Guidelines Alliance, conducted two focus groups to better understand consumers' attitudes toward the concept of energy balance, particularly as it relates to weight management, says Wendy Reinhardt Kapsak, IFIC's director, health and nutrition. Overall, consumers associate "energy" with "the feeling of having energy to do the things they want and need to do, not with calories. In fact, consumers react negatively to calories and the idea of having

to count them to manage their weight," the research concluded.

This September, IFIC is releasing new quantitative trending research investigating consumer attitudes towards various food components and health conditions. As part of that study, 501 consumers were queried about energy and fatigue. "We found that energy means different things to different people," says Reinhardt Kapsak. When consumers think about energy, they relate it to mental or physical tasks or simply as an absence of fatigue.

"When we asked about mental performance, 5% say they have an issue in this area, but a much higher number, 39%, are concerned about it," she said. In regards to physical performance, 5% say they have an issue with it, while 34% are concerned about it. Lastly, IFIC found that 17% state they have issues with fatigue or currently deal with lack of energy, while 36% said they were concerned about it.

Function Drinks' products were formulated with the expert help of a flavoring company and are labeled with a Supplement Facts panel and the FDA disclaimer regarding claims. Additionally, the levels of the nutraceutical ingredients are detailed. Its "Pacific" coconut-flavored Vacation variety contains magnesium, zinc, L-theanine and L-5 hydroxytryptophan (5-HTP)—the latter ingredients are being investigated for their cognitive effects.

This year's *Prepared Foods*' functional foods survey also investigated the concept of energy from the viewpoint of R&D and marketers in food companies. A quick look at Mintel's GNPD shows a wide range of foods, beverages and supplements describing themselves as energy products. Examples include the PepsiCo's SoBe Adrenaline line, which has a Supplement Facts label quantifying amounts of vitamin B6, B12, taurine, D-ribose and L-carnitine; it also lists the presence of inositol, guarana and Panax ginseng. Masterfoods' "low GI" Snickers Marathon Energy Bar (labeled as a "Good Source of Fiber. Delivers Long Lasting Energy"), Kraft Foods' Planters NUT-rition brand Energy Mix (a "natural source" of energy from nuts, soy nuts and honey-roasted sesame sticks) and Canada's Campbell's Ignite™ line of frozen meals (delivering protein to help build and repair muscles, vitamins and minerals, and food energy).

In *Prepared Foods*' survey, 63% of the 229 survey respondents said it is important for the products to be developed for "sustained energy release." Only 28% checked off what is perhaps the most "traditional" meaning of energy:

Prepared Foods' survey asked, "If presented with a popular new ingredient that was rapidly gaining both scientific support for its health benefits as well as increased consumer recognition, in order for you to consider its use in your product, how important would it be that the ingredient:" and several GRAS categories were listed. Some 39% of those surveyed said they would consider using an ingredient if the FDA responded it had no questions when a GRAS notification had been submitted to them.

Considering GRAS Status Ingredients

Ingredient Status	% Saying They Would "Definitely Consider Using It"
Has GRAS status through self-affirmation, with FDA notification and a response of "has no questions."	39%
Marketed by a solid, reputable ingredient supplier (regulatory status would not be investigated by our company).	31%
Has GRAS status through self-affirmation, without FDA notification.	23%
Has GRAS status through self-affirmation, with FDA notification, but which the company withdrew request for evaluation.	12%

Source: The "2007 *Prepared Foods*' R&D Trends Survey: Functional Foods;" base: n = 229

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"the presence of calorie-providing components." (See chart "What Makes it an Energy Product?")

Energy drinks are increasingly criticized for featuring stimulants. A widely disseminated October 2006 Associated Press article reported that market leaders like Austrian-based Red Bull and Hansen Natural Corp.'s Monster tout "promises of weight loss, increased endurance and legal highs." The article quotes Simmons Research figures stating that 31% of U.S. teenagers (7.6 million) say they drink energy drinks. Such popularity is hard for any industry to turn its back on, and companies will grapple with this issue for years to come. Interestingly, only some 47% of *PF* survey respondents said it would be important for energy products to contain stimulants, while 49% report it is important for such products to contain specialty ingredients to enhance energy metabolism.

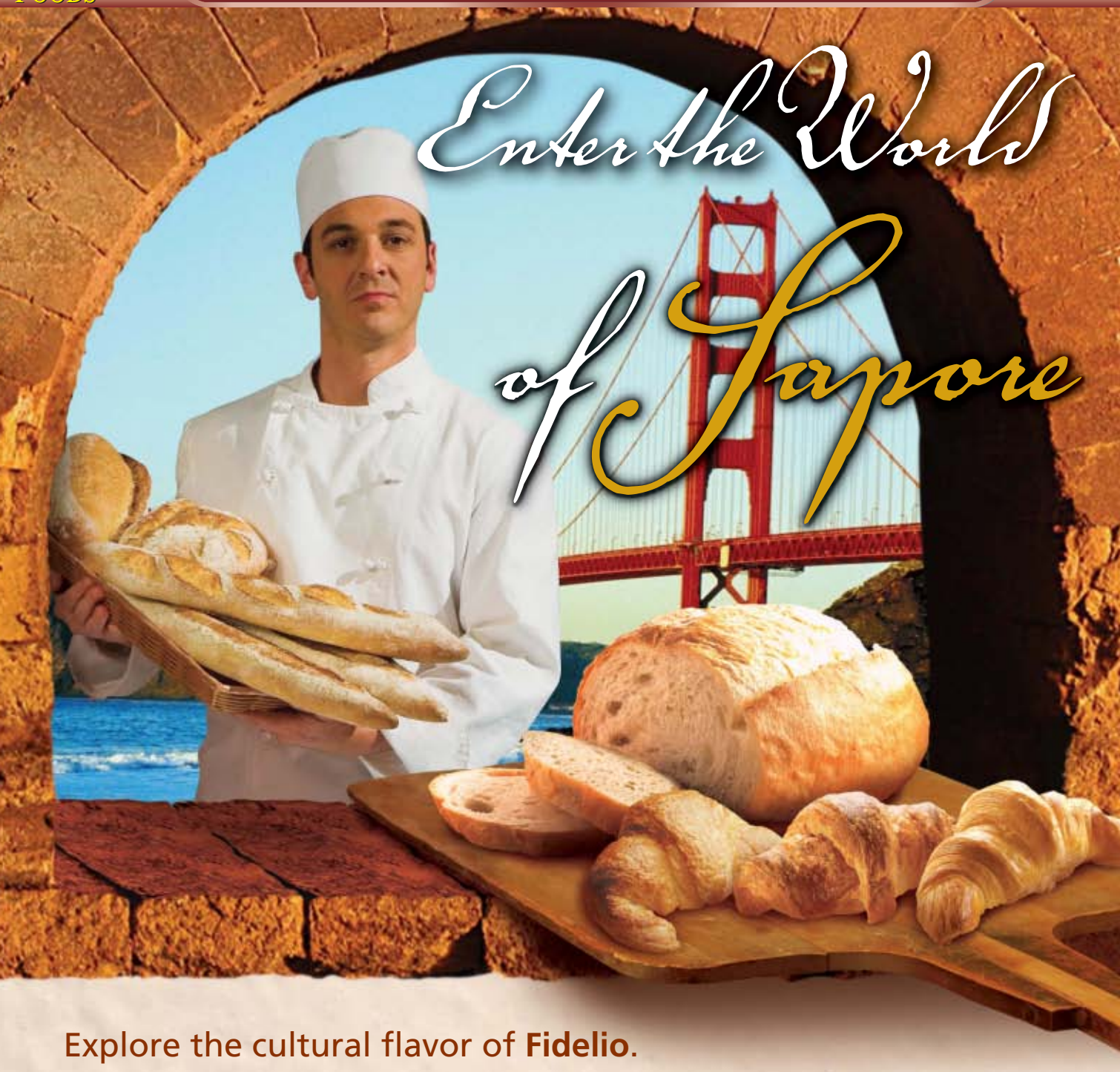
Energy Chemicals from Carnitine to Chromium

Many ingredients added for energy are also key metabolites in the human body. For example, L-carnitine transports long-chain acyl groups from fatty acids into the mitochondria, or organelles inside cells known as "cellular power plants." Mitochondria generate most of the cell's ATP (adenosine 5'-triphosphate), a usable source of chemical energy. Chromium is needed for glucose utilization by insulin and also is considered to have a role in energy metabolism. As for taurine, at least one recent finding supports taurine transport as a crucial factor in alleviating muscle fatigue in strenuous workouts and for the maintenance of total exercise capacity (Ulrich Warskulat, U, et al., 2004, *FASEB J.* 18:577-9). Ribose, primarily used in the form D-ribose, is a component of ATP and several other chemicals that are critical to metabolism. One study's result supports "the hypothesis that the availability of ribose in the muscle is a limiting factor for the rate of resynthesis of ATP," although "the reduction in muscle ATP observed after intense training does not appear to be limiting for high-intensity exercise performance (Hellsten, Y, et al., 2004. *Am J Physiol Regul Integr Comp Physiol*. 286:R182-8)."

B vitamins frequently are found in energy products. Red Bull communicates its role to customers on its website simply as "B-group vitamins play an important role in energy metabolism, such as the build-up and break-down of carbohydrates, fat and protein. B vitamins are also shown to support mental and physical performance."

Trends in Organic to Cardiovascular

As fast-growing as the energy products category has been, it is not the most popular functional food category. Those surveyed by this year's *Prepared Foods*' functional foods questionnaire were given a list of 16 health conditions and



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asked, "What ingredient characteristics or benefits present the greatest opportunity for your product development efforts?" and allowed to check off as many categories as they thought applied; some 30% checked "energy." However, the vague and broad attribute of "natural" came in first, with 58% checking off this opportunity. "Organic ingredients" was the next, with 42% of respondents indicating it was an area with good prospects. "Cardiovascular health" followed at 36%, "digestive health" at 33% and "cholesterol reduction" at 32%.

Respondents were enthusiastic about both natural and organic products; however, senior executives from Kraft Foods, Nestlé, Campbell Soup Company and General Mills that spoke on a health, wellness and foods panel at the 2007 Institute of Food Technologists annual meeting in Chicago were a bit more circumspect. The interest in "natural" was linked to consumers' desire for simplicity. During the Q&A period, an audience member noted that only one company, General Mills, had said much of anything about organic.

Y. Marc Belton, executive vice president, Worldwide Health, Brand and New Business Development with General Mills, responded that double-digit growth in organic foods might be hard to sustain. Supply of organic ingredients is an issue, one possibly made even more challenging due to the impact of bio-fuels. Matthew Roberts, managing director of corporate business development with Nestlé, said there was some overlap between healthy foods and organic. He felt organic was more of a social issue, a commitment.

Choosing Ingredients for Health

The functional foods survey also explored interest in healthy ingredients. Results dovetail well with the "greatest opportunities" question. The survey listed 27 additives and asked the question: "During the next two years, do you expect the following ingredients to become more or less important in your functional foods formulation efforts?" (See chart "Emerging Nutrients.") As with *Prepared Foods*' "2006 Functional Foods Survey," "antioxidants" came out on top. Just as the term "natural" can be applied to a broad range of ingredients, so too can many ingredients be considered antioxidants.

With cardiovascular health, digestive health and cholesterol reduction listed as the top health conditions providing the most opportunities, it is not surprising that dietary fiber, omega-3 fatty acids, probiotics, whole fruits and prebiotics—all which benefit heart and/or digestive health—ranked high on the opportunities list. Additionally, prebiotics, probiotics and phytosterols/stanols, ingredients that showed the greatest increase from last year, are categories linked with gut health and cholesterol reduction.

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Ingredients in the survey are generally accepted by the mainstream food industry. Yet it is the innovative niche ingredients that may have the greatest ability to help differentiate a product. Their perceived regulatory status determines their use and at what levels—a subject also investigated in this year's survey.

Many people do not understand the Code of Federal Regulations in regards to permitted food ingredients, notes George Burdock, Ph.D., president of the Burdock Group. Generally Recognized as Safe (GRAS) substances are those considered safe by experts—qualified by scientific training and experience—and, as GRAS, they are exempt from the Federal Food, Drug and Cosmetic Act pre-market approval process.

For a GRAS determination, experts must know at what level and in which of 43 food categories the ingredient will be used (categories are listed in 21 CFR §170.3(n)) and why it is used. The regulations also provide for 32 technical effects or reasons, says Burdock. These are listed in 21 CFR §170.3(o), but "functional food" is not one of them. However, FDA has shown flexibility in allowing the addition of ingredients for no reason other than that the consumer might want to increase his intake of a particular substance.

Historically, the proposed levels of use for an ingredient were at a dose that did not result in a biological effect. When animal safety tests were done, increased levels of the ingredient were administered until a change in the animal was observed. The goal then was to stay well below that level in a food. In functional foods, a physiological benefit—a change—is desired. Thus, higher levels of a substance than were originally approved are needed. These higher levels needed for the "functional" effect will require another GRAS review, states Burdock.

The term "GRAS self-affirmation" often describes a situation where a manufacturer has determined its ingredient to be GRAS without the review of an independent third party. However, because of possible accusations of a conflict of interest, the manufacturer often prefers review by an independent party. "GRAS notification" is the voluntary process of notifying the FDA that a substance has been found to be GRAS, says Burdock. The FDA must respond in writing to the notifier. Currently, the substance then falls under one of four statuses: "pending," "FDA has no questions," "at notifier's request, FDA ceased to evaluate the notice" or the "notice does not provide a basis for a GRAS determination." The "FDA has no questions" status basically means the FDA reviewed a product's GRAS claim and had "no comment;" that is, there would be no challenges on the product's GRAS status at that time. This favorable response increases the likelihood that it will be considered for use by a food company. (See the chart "Considering GRAS Status Ingredients.")

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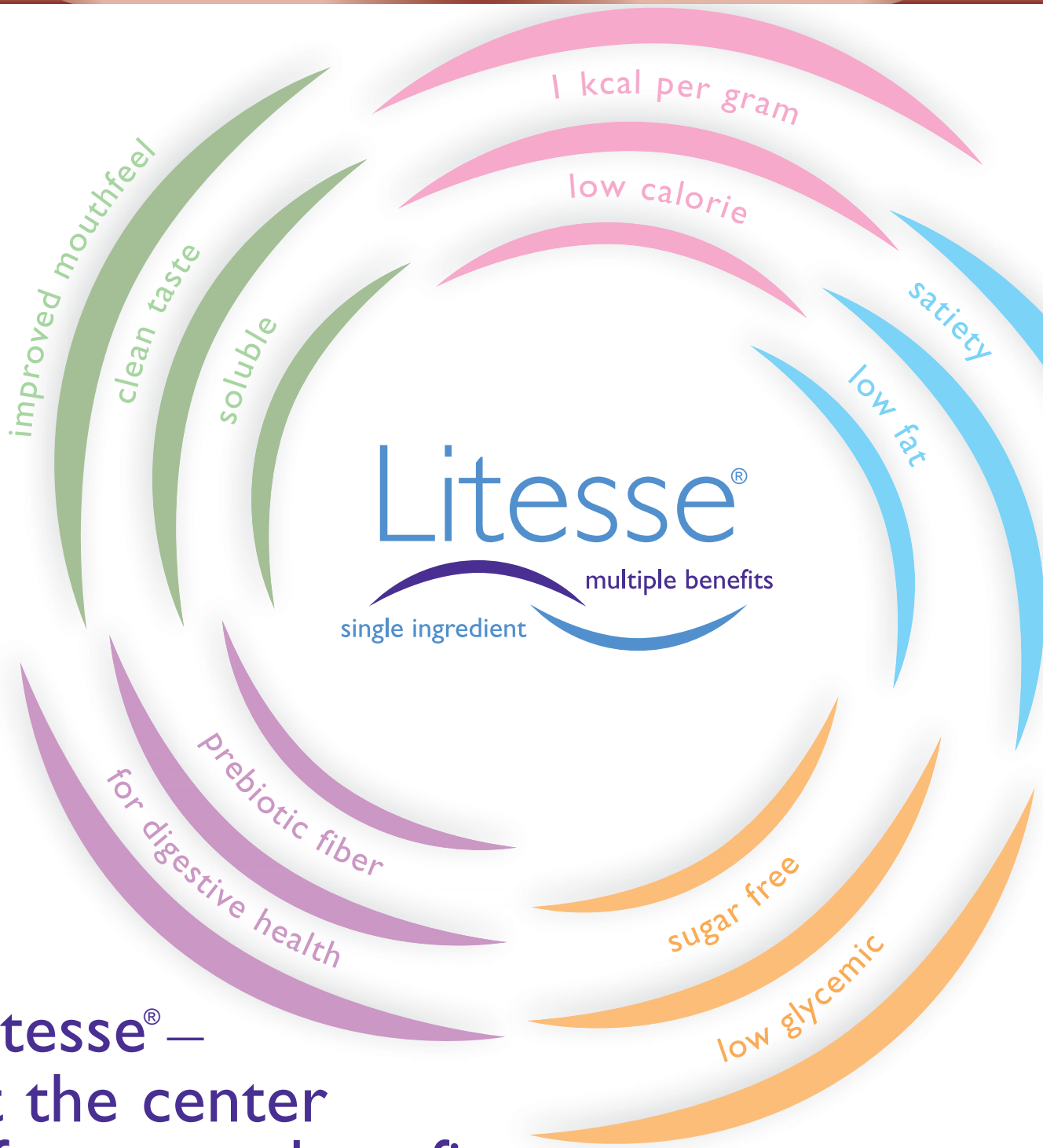

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Emerging Nutrients

	2007	2006
Antioxidants	55	56
Organic ingredients	55	50
Dietary fiber	54	51
Omega-3 fatty acids	52	52
Probiotics *	37	25
Fruits whole—not extracts	33	31
Prebiotics *	33	18
Calcium *	32	48
Botanicals	30	27
High-oleic fats/Oils	29	32
Vitamins *	27	40
Beta carotene	26	25
Soy protein **	26	36
Lycopene	24	23
Fruit extract	23	24
Phytosterols/Stanols ***	23	16
Minerals **	21	29
Isoflavones	20	20
Lutein	20	16
Whey protein **	20	29
Folic acid	19	22
Vitamin E	18	24
Grapeseed extract	17	17
Oligosaccharides	13	15
Acetyl-L-carnitine	5	8

NOTE: * = Significant difference at the 99% level; ** = Significant difference at the 95% level; *** = Significant difference at the 90% level

Source: The 2007 and 2006 "*Prepared Foods*' R&D Trends Survey: Functional Foods;" base: 2007, n = 229; 2006, n=237

The survey investigated emerging ingredients by asking: "During the next two years, do you expect the following ingredients to become more or less important in your functional foods formulation efforts?" Increased interest in more mainstream ingredients, such as soy proteins, has flattened as the category has matured. Food and nutritional processors note significantly increased interest in pre- and probiotics and phytosterols/stanols.

As with SoBe's Adrenaline Rush, Function Drinks positioned its products as dietary supplements rather than foods. They are labeled with "Supplement Facts" panels and FDA disclaimer statements. Although the company faced the challenges of formulating scientifically supported ingredients into great-tasting products, Hughes says their greatest challenge was more unique. "When you try to do something that breaks the mold in terms of both philosophy and product form—some ingredients have not been presented in drinkable format before—it is very hard [to find] people that are 120% committed to the idea," explains Hughes. "Your business partners will tell you that consumers don't care about science, that the costs are too high and so on. Your business partners need to be believers." Such challenges are great, but the opportunities are as well. pf

Website Resources:

http://en.wikipedia.org/wiki/N-acetylcysteine — Information on N-acetyl-L-cysteine; other specialty energy ingredients can also be researched

www.PreparedFoods.com — Type in "functional foods survey" for a list of archived articles on this subject

www.sciencedirect.com — Type in "Generally recognized as safe GRAS: history and description" into the "Title, abstract, keywords" field to purchase a useful review of this subject written by George Burdock and Ioana Carabin, published in 2004 in *Toxicology Letters*, 150:3-18

www.redbullusa.com — Click on Products, then on Ingredients, for a brief discussion of ingredients used

www.snickersmarathon.com — Product site includes an interactive "energy calculator" that emphasizes calories required for physical activities

www.bioenergy.com/Bioenergy_RIBOSE.html — Information on D-ribose

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Even as consumers look for bolder and fresher flavors, foods themselves have increasingly complicated formulations. Selected excerpts from a recently published book provide insights into the impact of hydrocolloids, protein and fat on aroma and flavor release.

Amy Schauwecker, Contributing Editor

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As trends toward a fresher and bolder flavor impact continue to proliferate, product developers strive to maximize product quality and value. Many variables affect flavor perception in foods. Food systems are increasingly complicated, especially with popular food trends—salt, sugar and fat and increased fiber—all affecting flavor perception. Hydrocolloids, protein and fat are just a few factors that influence aroma and flavor release. For food processors, flavor-optimized modeling systems that vary viscosity, fat, protein and carbohydrate levels are valuable in predicting suitable flavor applications. Release behavior of flavor compounds in various applications is discussed in the following selected abstracts.

Taste Entrapment

Abstract: "Role of viscosity and hydrocolloid in flavor release from thickened food model systems," E. Bylaite and A.S. Meyer.

[Release behavior of two aroma compounds, diacetyl and isoamyl acetate, from viscous food model systems having different viscosities was studied. Aroma partitioning and release rates were evaluated in pure water and in hydrocolloid solutions of sodium alginate, guar gum, locust bean and gellan at different concentrations and viscosities. The results showed that the aroma compounds were released differently from viscous solutions thickened to the same viscosity by different hydrocolloids. It was concluded that the nature of aroma compounds, type and concentration of thickener, and not the viscosity of the system, are determining factors in aroma release.]

Hydrocolloids often are chosen for applications based on processing limitations, physical characteristics of the end product and cost. However, cost issues become null if excessive amounts of flavor are required to compensate for poor flavor perception or retention in the product.

Gums impact flavor release through their polymeric structure and physical chemistry. Lowering water content in a food system often increases physical and microbial stability of starch-based foods, but the increase in viscosity can also assist in binding more aroma compounds. Common polymers assist in the development of moisture barriers, shelflife enhancement and controlled release of flavors.

In the viscous food model systems discussed in this abstract, more diacetyl compounds were retained with

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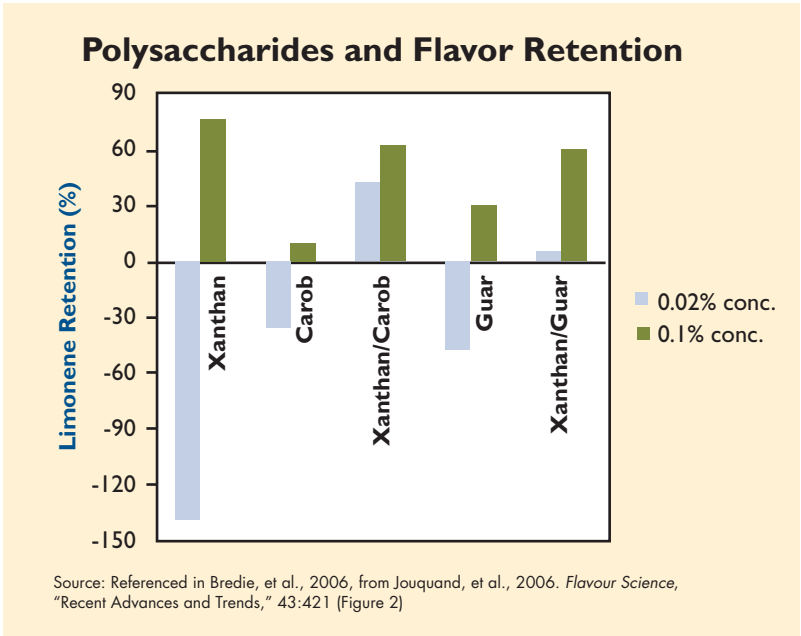

Source: Referenced in Bredie, et al., 2006, from Jouquand, et al., 2006. *Flavour Science*, "Recent Advances and Trends," 43:421 (Figure 2)

Limonene retention, at 35˚C, is impacted by the type and concentration of polysaccharide solutions.

locust bean and gellan at higher viscosities (880cP). The overall higher retention of isoamyl acetate compared to diacetyl observed in all the hydrocolloid mixtures was theorized to correlate with interactions involving the hydrophobic ester and hydrocolloids. Diacetyl release was not affected by increasing viscosity in sodium alginate and guar gum solutions. The release rate of both compounds was found to differ—depending on the hydrocolloid variety and concentration—and was independent of viscosity. The research suggests that a fundamental understanding of hydrocolloid ingredients themselves is more valuable to maximize flavor retention rather than increasing physical thickness of the product.

Abstract: "Determination of specific interactions between aroma compounds and xanthan/galactomannan mixtures," C. Jouquand, C. Malhaic and M. Grisel.

[The gas/liquid partition coefficient (K) of aroma compounds was measured in pure polysaccharide solutions and in polysaccharide mixtures using the Phase Ratio Variation method. With this method, the retention in 0.1% and 0.02% polysaccharide concentrations was determined. The results showed that in semi-dilute regime (0.1%), all solutions and mixtures induced a high retention of limonene and hydrophobic esters, thus confirming hydrophobic interactions between these compounds and the polymer chains. In dilute pure polysaccharide solutions (0.02%), a decrease in retention was noticed for the esters and a "salting out" effect for limonene. Inversely, at 0.02%, mixtures of polysaccharides showed a good retention of aroma compounds explained by the well-known synergistic interactions between xanthan and carob gums.]

Some 60% or more of limonene was retained by all the variables with 0.1% xanthan (see chart "Polysaccharides and Flavor Retention"). In more dilute concentrations of 0.02%, there was a "salting out" effect with release of limo-

nene exhibited by the polyelectrolytic behavior in xanthan solutions. Some ingredients that are shown to increase flavor retention may effectively mask off-flavors, which become apparent due to flavor migration into the product atmosphere.

Protein Perseverance

Abstract: "How can protein ratio affect aroma release, physical properties and perceptions of yoghurt?" A. Saint-Eve, N. Martin, C. Levy and I. Souchon.

[Among yoghurt dairy components, the type of proteins is known to influence the behavior of odorous volatile organic compounds (VOC). The aim of this study is to focus on the impact of the proteins on the physicochemical (rheological properties, microstructure, VOC release) and sensory (texture and flavor) properties of 4% fat flavored stirred yoghurts. Yoghurts varied according to the ratio of milk proteins used. Large differences were highlighted concerning the structures of the different yoghurts observed by scanning electron microscopy. Yoghurts differed largely in viscosity and in texture perception. Different effects on retention of VOC and the intensity of most olfactory attributes of the strawberry flavor were observed in yoghurts.]

In order to retain "fresh" flavor in fruit-flavored dairy products, manufacturers may add green note aromas (for example, hexanal), which are found naturally in fruits and vegetables. In this study, researchers experimented with 17 volatile flavors that are typically used to maximize quality in yogurt. The study assessed flavor intensity in yogurt thickened with caseinates, whey protein and milk powder. The thickest yogurt using caseinates resulted in the least homogenous density. In contrast, the yogurt using whey protein was the least viscous, but the densest. Yogurt using milk powder was in between the two. The sensory descriptive analysis indicated that the thinner yogurts made with whey protein and milk powder showed more mouth coating. Release of ethyl butyrate and methyl cinnamate were highest with milk powder, but sensory results did not show any loss of intensity. Although caseinate-containing samples retained the most volatile organic compounds, the actual flavor intensity by olfactory description was the lowest of the three. The flavor profile in yogurt thickened with whey protein was characterized as the most intense, especially in green note flavors. The study supports that volatile retention cannot predict flavor intensity of a product. Perception is influenced by viscosity, protein structure and texture interactions.

Fat Bursters

Abstract: "The role of lipids in aroma/food matrix interactions in complex liquid model systems," C. Riera, E. Gouezec, W. Matthey-Doret, F. Robert and I. Blank.

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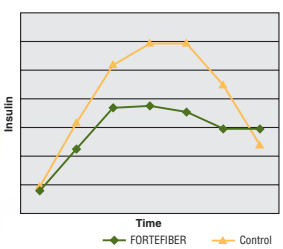

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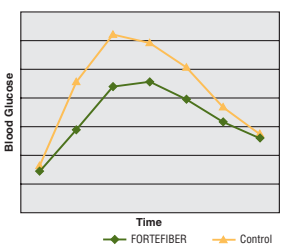

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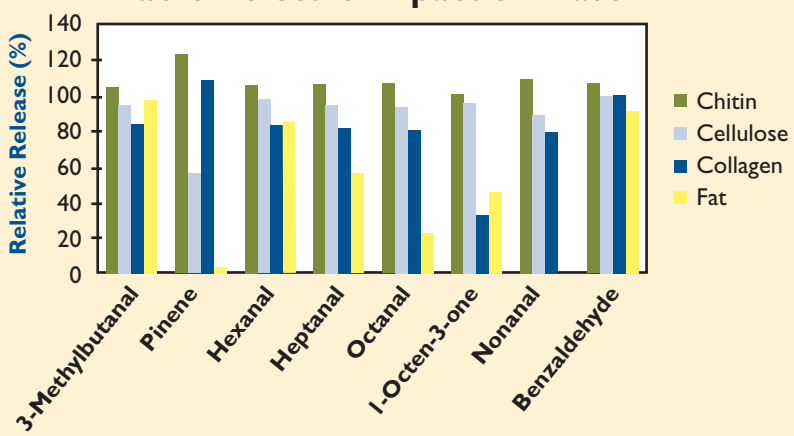

Source: Referenced in Bredie et.al., 2006, from Riera, et.al., 2006. *Flavour Science*, "Recent Advances and Trends," 43:411 (Figure 1)

Macromolecules such as chitin, cellulose, collagen and fat affect the release of selected volatile compounds from a model system.

[The release of nine aroma compounds was investigated in complex liquid bouillon-type model systems containing various non-volatile constituents. The relative release was determined by static headspace GC-MS as a function of the bulk composition. Among the non-volatile food constituents studied, fat appeared to be very efficient in binding volatile aroma molecules. This retention by the fat was directly correlated with the intrinsic physical properties of the aroma compounds, such as the water/octanol partition coefficient. The individual effect of the major fat constituents was studied as well, indicating that, for example, even small amounts of phospholipids may effectively retain volatile compounds.]

Protein and hydrocolloids are typically successful in retaining aroma compounds in thick yogurt and dressing applications. However, in more fluid applications, as illustrated in this study, fat is more effective at retaining aroma compounds. The effectiveness not only varies based on the flavor chemical structure, but fatty acid chain length, saturation level and fatty acid sequence also influence retention.

According to one study, while protein and hydrocolloids retain aroma compounds in thicker applications such as yogurt and spoon-able dressings, fat is more effective at retaining aroma flavor compounds in more fluid applications.

More variables are involved when other ingredients are added, as with any complex food system. None of the non-lipid ingredients, such as chitin, collagen and cellulose, bound aroma compounds as effectively as fat. Chitin was the most effective at releasing aromas. Collagen retained 20% and 70% of aliphatic aldehydes and 1-octen-3-one, respectively. Cellulose retained 60% and 15%, respectively, of apolar compounds α-pinene and nonanal. On the contrary, fat released polar compounds including 1-hexanol and 3-methyl butanal. Previous studies support that very high concentrations of hydrocolloids and proteins are required to retain flavors, in contrast to fat. (See chart "Macromolecule Impact on Flavor.")

Cultivated Palates

Abstract: "Effect of physiology and physical chemistry on aroma delivery and perception," A.J. Taylor, K.S.-K. Pearson, M.D. Hodgson, J.P. Langridge and R.S.T. Linforth.

[To perceive aroma compounds, they must be delivered to the olfactory receptors—a process that depends on physical chemistry and physiology. The role of these two factors was studied using

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See Food Master-*INGREDIENTS*, p. 152-153

Research suggests the characteristics of individual hydrocolloid ingredients, such as those typically used in salad dressings and sauces, are more important to understanding flavor retention than the overall viscosity of the final product.

a variety of delivery mechanisms, ranging from gas phase delivery to the location and form of the aroma compounds in the food matrix. The effect of mouth loading and body position was also investigated. Delivery to the olfactory receptors was monitored in vivo using atmospheric pressure chemical ionization-mass spectrometry (APCI-MS), and physiological responses were monitored simultaneously. It was found that body position and mouth loading affected the opening of the velum, while common aroma solvents had a significant effect on the delivery of hydrophobic compounds. Aroma delivery from droplets of pure compounds suspended in the food matrix was very intense and could not be explained by conventional partition mechanisms. A delivery mechanism based on direct volatilisation from the air-liquid interface was proposed to explain this intense release, which is also seen from some commercial materials.]

When the velum, located between the mouth and throat, is closed, less aroma transfer can occur from the mouth to nose than if an individual swallows. Human velum behavior of opening and closing varies based on individual physiology and consumption behavior. This suggests one reason that "tasting" may yield different evaluations than "consumption."

Release of hydrophilic aroma compounds was not affected by the common flavor solvents ethanol and propylene glycol. However, hydrophobic compounds were affected. Results suggest that solubilized aromas encapsulated in glass-like materials demonstrated an intense "burst" of aroma release and are not partition-driven. Controlled release is used in many confectioneries. An efficient hydrocolloid can control the rate of flavor release ranging from instant to extended. Developers seek polymers that can entrap volatile aroma molecules and release them at the appropriate time.

Researchers continue to expose intriguing new aspects to the complex mechanisms surrounding flavor release and experience. Whether the flavored system is optimized with hydrocolloids, protein or fat, it is clear from these studies that viscosity and flavor retention alone are not accurate predictive measures for flavor perception. Developers must also have a thorough understanding of the chemical structures, consumption behavior, concentrations used and synergies with other materials. Human anatomy and eating and drinking behavior vary, making comprehension of flavor perception more complicated. Scientists will continue to optimize tools to accurately measure flavor intensity and perception to support product launch and success. pf

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Flavor Savers

Taste is often a key determinant of a product's shelflife. Physical properties of ingredients and the chemical reactions they undergo can change flavors, but ingredients such as antioxidants, acidifiers and buffers can help extend shelflife and improve taste.

Elizabeth Mannie, Contributing Editor

PHOTO COURTESY USDA/ARS SCOTT BAUER

Throughout the shelflife of a food, transformations occur which impact flavor. Over time, organic material changes through a number of processes. In most products, flavor starts to decline, and off-flavors develop due to oxidation. In addition to oxidation, other changes such as crystallization can affect quality. Flavor also can be degraded by exposure to light or be lost during packaging, through heat processing or evaporation. Shifts in pH and ingredient reactions are also contributing factors in flavor decline.

To preserve the flavor of a product, formulators must consider regulations, customer requirements, application, cost, sensory properties, health aspects (i.e., sodium vs. potassium) and potential for ingredient interactions.

"Our approach is to identify consumer insights for their favorite flavors and formats. With each new project, a team of product developers, process and packaging engineers, flavorists, analytical chemists, and sensory and regulatory scientists bring their expertise to the table. We apply known solutions to new challenges or come up with new methods to resolve issues," offers Barbara Raphael, Ph.D., executive vice president of Cadbury Schweppes Americas Confectionery.

"Cadbury Schweppes surveyed consumers and found that 66% of Americans surveyed wanted a longer lasting chewing gum," Raphael states. "We have made significant investments in long-lasting flavor technology which was introduced in Stride®, the Ridiculously Long Lasting Gum®." According to Raphael, Stride was introduced last year and quickly became one of the most successful gum launches in U.S. history.

Citrus-flavored beverages, especially when cloudy, can have issues with oxidation of the terpenes used in these flavor systems. BHA often is used to protect these components in citrus and other flavor oils.

The company's strategy starts with using premium materials, such as high-quality flavor oils, specially formulated to remove components that contribute to oxidation of flavors. Antioxidants, encapsulation and packaging also are used to protect flavor where required. Fat, pH, moisture and other product attributes need to be considered and balanced. "For example, fat may affect texture in addition to increasing oxidative stability challenges. Hygroscopic materials can pick up moisture, which can also accelerate deterioration," adds Raphael.

Physical and Chemical Considerations

Understanding the chemical reactions that take place during processing and storage is crucial to preventing flavor degradation.

Showcase: Antioxidants, Acidifiers & Buffers for Shelflife

Research shows a new flavor modifier extends shelflife of fresh, frozen, pre-cooked and further processed meats, plus masks off-notes in meat applications—including those containing soy. Wix-Fresh™ Max from Wixon also **preserves the flavor intensity of spice notes and reduces warmed-over flavor in meats.** When added directly to breading systems in deep-fried applications, it helps to reduce rancidity associated with frying oils while enhancing overall flavor. Wixon, Ron Ratz, 800-841-5304, Ron Ratz@Wixon.com, www.Wixon.com

An oil-soluble formulation based on rosemary extracts that fight oxidation in fresh and chilled patés has recently been introduced. SyneROX 4, by Vitiva of Slovenia, helps **maintain the original flavor, color and taste of the paté and its microbiological stability,** extending the product's shelflife considerably. The easily blendable formulation is allergen and GMO-free and is available from P.L. Thomas in the U.S., Canada and Mexico. P.L. Thomas, Paula Nürnberger, 973-984-0900, paulan@plthomas.com

Dried plums, powders and juice concentrates provide a natural defense against enemies of food shelflife. Dried plums are naturally rich in fiber and high in sorbitol to bind and maintain moisture in meat and bakery products. Dried plums' acidic profile, particularly malic acid, and an exceptionally high antioxidant content fend off the ravages of bacteria and oxygen. California Dried Plum Board, Richard Peterson, rpeterson@cdpb.org, www.californiadriedplums.org

Microencapsulation technology enables manufacturers to fortify foods and beverages with vitamins, minerals and other nutrients without compromising food flavor and aroma. LycoRed's microencapsulation process **solves the issue of taste, texture and ingredient cross-interactions by microencapsulating the fortification ingredients and then combining them in a ready-to-use premix.** Microencapsulation protects ingredients from oxidation, increases stability and shelflife and reduces hygroscopicity. An added cost benefit of LycoRed microencapsulated ingredients is decreased overages, and the ready-to-use premixes cut costs by simplifying the path of manufacture. LycoRed Corp., William Redwood, 201-247-5875, info@lycored.com, www.lycored.com

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pH

A main consideration in choosing flavor stabilizers is the final target pH, explains Barbara Heidolph, marketing development manager for a popular phosphate supplier. Once the desired pH is determined, ingredients are selected based on their buffering capacity and the amount of pH adjustment needed. (See chart "Titration of Orthophosphoric Acid with Sodium Hydroxide.")

Fat Content

"Food products that contain fat have high risk for off-flavor development during storage," adds Heidolph. "Fat composition of a food product can affect the flavor preservation approach. For example, the amount and source of fat can affect the stability of a beverage and the performance of the flavor system. When certain fats like fish oil-derived additives or dairy fat are present in a product, oxidative stability of the fat is a serious consideration,"

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"What does aspartame taste like?"

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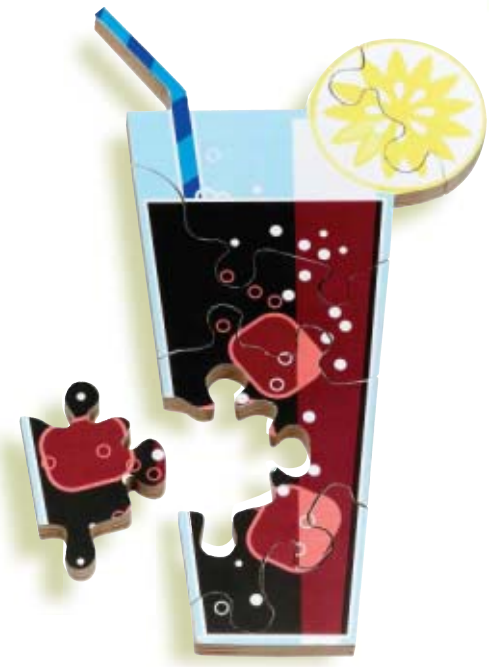
"Where does aspartame come from?"



Aspartame is made of amino acids, nature's building blocks of life. During digestion, the human body breaks down protein-rich foods, such as meat, fish and dairy, into amino acids. These are then reassembled into different proteins the body needs to grow and function. Aspartame is made from two of these amino acids. Amino acids are a natural part of our diet from our very first days, and the two amino acids in aspartame are also in breast milk.

www.aboutaspartame.com

To review Ajinomoto's new consumer brochure, "Aspartame: Sweetness from Nature's Building Blocks," and other educational tools, visit www.aboutaspartame.com.

For more information on aspartame, please contact:

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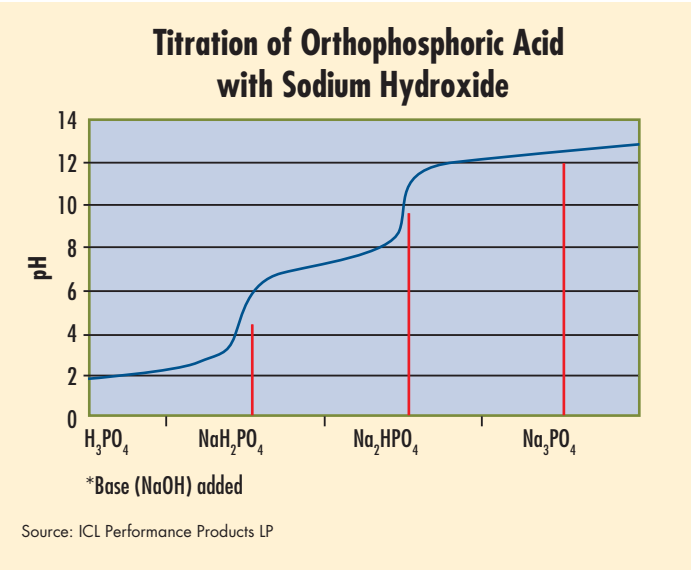

Source: ICL Performance Products LP

Buffering is the ability of a compound to maintain pH despite the addition of acidity or alkalinity. As NaOH is titrated, the pH is buffered (does not change significantly relative to the alkalinity added) until it reaches the first pKa at ~pH 5, where there is predominantly NaH_3PO_4 (monosodium phosphate or monobasic sodium phosphate or MSP). The pH is again buffered until it reaches the next pKa at ~8.5 pH and so on.

explains Greg Mondro, senior flavor chemist at a supplier of flavor systems. "Flavor of the fat or oil significantly affects flavor stability and perception of the overall product."

"Fat oxidation can be catalyzed by the presence of metal ions, especially iron. Phosphates can be used to sequester iron and stabilize fat, to reduce off-flavor from rancidity," contributes Heidolph. "Phosphates and acidulants such as phosphoric acid act as synergists with most antioxidants like butylated hydroxy anisole (BHA)," she adds. Phosphates interact with metal ions such as copper and iron. Acidic salts like sodium or potassium phosphates and acidulants help create a reducing environment of hydrogen ions, which aids in regeneration of antioxidants.

Sausages, for example, are formulated to contain significant levels of fat. Phosphates are used to bind metal ions, especially iron, to slow the rate of rancidity development. Fat is a consideration in other foods as well. Whole-grain

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baked goods contain higher levels of fat than white bread and, therefore, have shorter shelflives. Fried foods like French fries have off-flavors if the frying fat has deteriorated.

Moisture

"Moisture is the bane of stability. Packaging is particularly helpful with keeping moisture out of our products. Moisture is very rigidly controlled, as its presence speeds oxidation and promotes ingredient and product degradation," mentions Raphael.

Most of the time, low water activity helps keep the product more stable. "Freeze drying is one way to achieve low water activity. This provides an unfavorable environment for microbial and enzymatic degradation, ultimately giving a better shelflife and more wholesome product," Rayburn adds.

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Ingredient Interactions

Ingredient interaction is always a consideration. An ingredient used for pH and buffering may also interact with cations like calcium or magnesium. If hydrocolloids are present in a system, interaction with calcium may negatively change the texture of the product.

"When using benzoates and ascorbic acid together in a beverage, benzenes can be formed. Benzene is a non-polar solvent and a powerful carcinogen. However, the FDA has not concluded the studies on this. Even when it does occur, it is found in lower levels than in most drinking waters," explains Mondro.

Reactions can also be caused by low pH. "The lower the pH, the more challenging to have a stable flavor system," explains Rayburn. The problem here is that many products rely on a lower pH to optimize the antimicrobial properties of chemical preservatives.

Browning flavor of baked goods is also pH-related. At higher pH levels, greater reaction occurs between sugars and protein. "The more browning, the more flavor associated with the Maillard reaction. The reverse is also true: by maintaining a low pH, the sugar-protein reaction can be inhibited, thereby reducing flavor development," explains Heidolph.

"High-intensity sweeteners or blends of sweeteners should also be considered. Aspartame, for example, degrades in low-pH systems. Sweetness, cooling and salt are all used to enhance flavors. Additionally, taste potentiators such as nucleotides can generally enhance flavor. These materials are often used in the savory snack industry, but they can be effective in confections as well," states Raphael.

Common Ingredients that Combat Flavor Loss

The food industry has at its disposal an array of ingredients that can be employed to prevent or hinder the chemical reactions leading to flavor loss.

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Antioxidants

BHA is a popular antioxidant used in citrus and other flavor oils. However, consumer desire for organic or all-natural claims can limit its use.

BHA is prepared from 4-methoxyphenol and isobutylene. Oxygen would preferentially react with it before oxidizing the food product in question, and anti-viral properties are currently being studied. The downside is that there have been carcinogenic effects in animal trials, and it cannot be used in organic or all-natural products.

Citrus-flavored beverages, especially cloudy beverages, have issues with oxidation of the terpenes used in these flavor systems. Also, acid hydrolysis of certain components (citral in lemon and lime flavors is a classic example) degrades these flavors in acidic beverages.

"Of course, consumers have come to accept these off-notes as a normal part of the profile," contributes Scott Rayburn, beverage applications manager for a popular flavor provider. High levels of sugars, especially reducing sugars such as high-fructose corn syrup, can cause off-color and cooked notes as the sugars age. Use of sucrose increases costs but abates the browning reactions.

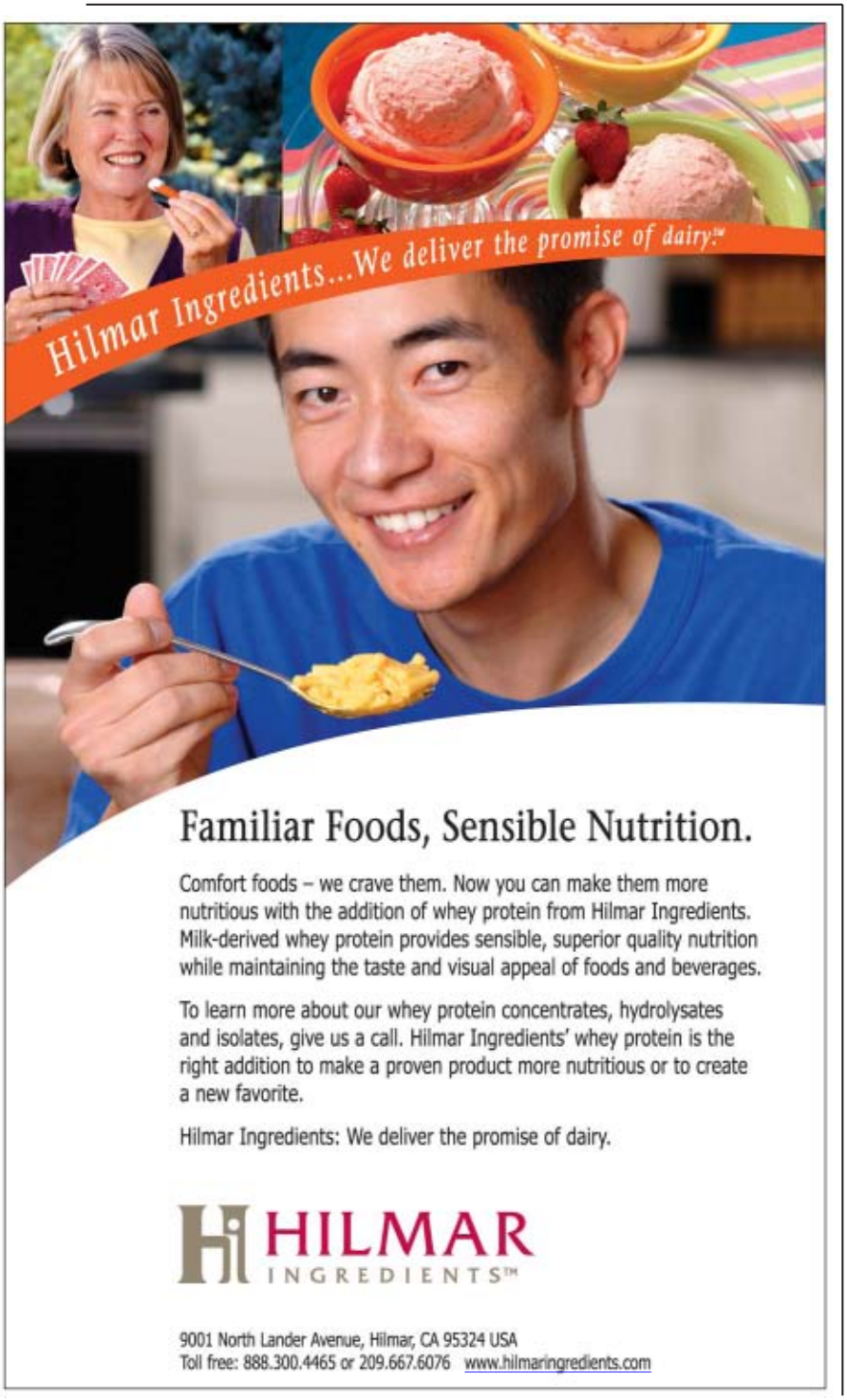
Tocopherols and purified rosemary extracts also are used to prevent oxidation and can be more desirable for clean labeling. "Sulfur dioxide is used as an antioxidant and antimicrobial in wines. Sulfur dioxide (usually added in its salt form, sodium metabisulfite) is a preservative for wine and some fruit and fruit juice. It has a powerful flavor in small amounts, but it has become a part of the accepted profile of wine," contributes Rayburn. There are other less flavorful preservatives to be used in most other food products.

The use of chelating agents such as ethylenediamine tetracetic acid (EDTA) is another method to preserve flavor. This chemical binds metal ions that can be used as building blocks by bacteria or catalyze off-color and flavor changes.

Acidifiers and Buffers

Acids generally provide tartness or enhance flavor. Phosphoric acid, for example, is commonly used in cola beverages. Organic acids have their own specific pH/buffering zone as well as their own flavor profile. In some applications, their flavor profile might be ideal for the product. Citric acid may contribute just the citrus note needed for an orange-flavored beverage or dessert. Lactic acid is likewise associated with fermented dairy products such as yogurt.

"All things being equal," Rayburn states, "an orange-flavored beverage will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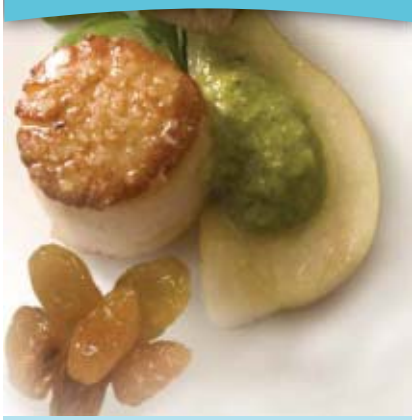

Chef Robert Del Grande's
Seared Sea Scallops with Salsa de Pasitas Verdes (Green Salsa with California Raisins) and Pears

California Raisins are the most versatile ingredient in the kitchen today. As leading chefs know, the flavor that California Raisins can add to any dish is immeasurable. California Raisins marry well with warm or spicy flavors like vanilla, cinnamon and citrus.

Del Grande often deploys California Raisins in novel combinations with salty, crunchy, spicy and smoky ingredients. This cooks up to a complex spectrum of subtle and balanced flavors, from the deep and earthy to the highly aromatic. His recipe for Sea Scallops with Green Salsa with California Raisins and Pears (featured above) is the perfect balance of sweet, succulent and savory.

Howsoever they are used, raisins provide a healthy, flavorful experience for your guests.

Robert Del Grande,
Executive Chef and Owner
Café Annie Houston, Texas

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Phosphates are used to bind metal ions, especially iron, to slow down the rate of rancidity development in high-fat meats like sausage.

taste better using citric acid rather than, say, phosphoric acid." Citric acid enhances citrus-flavored products, just as tartaric acid enhances grape-flavored products. While malic acid tastes great in apple-flavored beverages, its cost is sometimes prohibitive. "Additionally, the varying solubilities of acids can be leveraged to create acid blends that offer both up-front and long-lasting tartness," includes Raphael.

In general, the pH of a product impacts how it tastes. Acidulants and acid salts are known to affect the rate of evaporation of various volatile ingredients, thus controlling the aroma and flavor of a food.

Buffers

Phosphates help maintain flavor via two primary mechanisms: sequestration and pH control/buffering. Buffers and alkalinity adjusters like trisodium phosphate (TSP) and tripotassium phosphate (TKP) raise the pH of fat-containing products. A higher pH helps maintain the emulsion and stabilizes the fat in the system, preventing rancidity or "soapy-type" flavor issues.

"In high-acid products such as Fruit-A-Burst chewing gum and Halls Defense Vitamin C® throat drops, buffer systems help protect flavor and maintain tartness. Otherwise, the acidity can cause chemical changes such as sugar inversion, which can negatively affect texture and appearance. BHT and tocopherols are also used to act as antioxidants that help protect freshness," Raphael explains.

"The phosphate salts are excellent buffering agents, especially the ortho salts. Depending on the target pH, one or a combination of salts, either sodium or potassium (MSP, MKP, DSP, DKP, TSP and/or TKP) can be used," states Heidolph. "As phosphate chain length gets longer, the buffering capacity is reduced. Therefore, ortho is better than pyro, which is better than tripoly," she adds.

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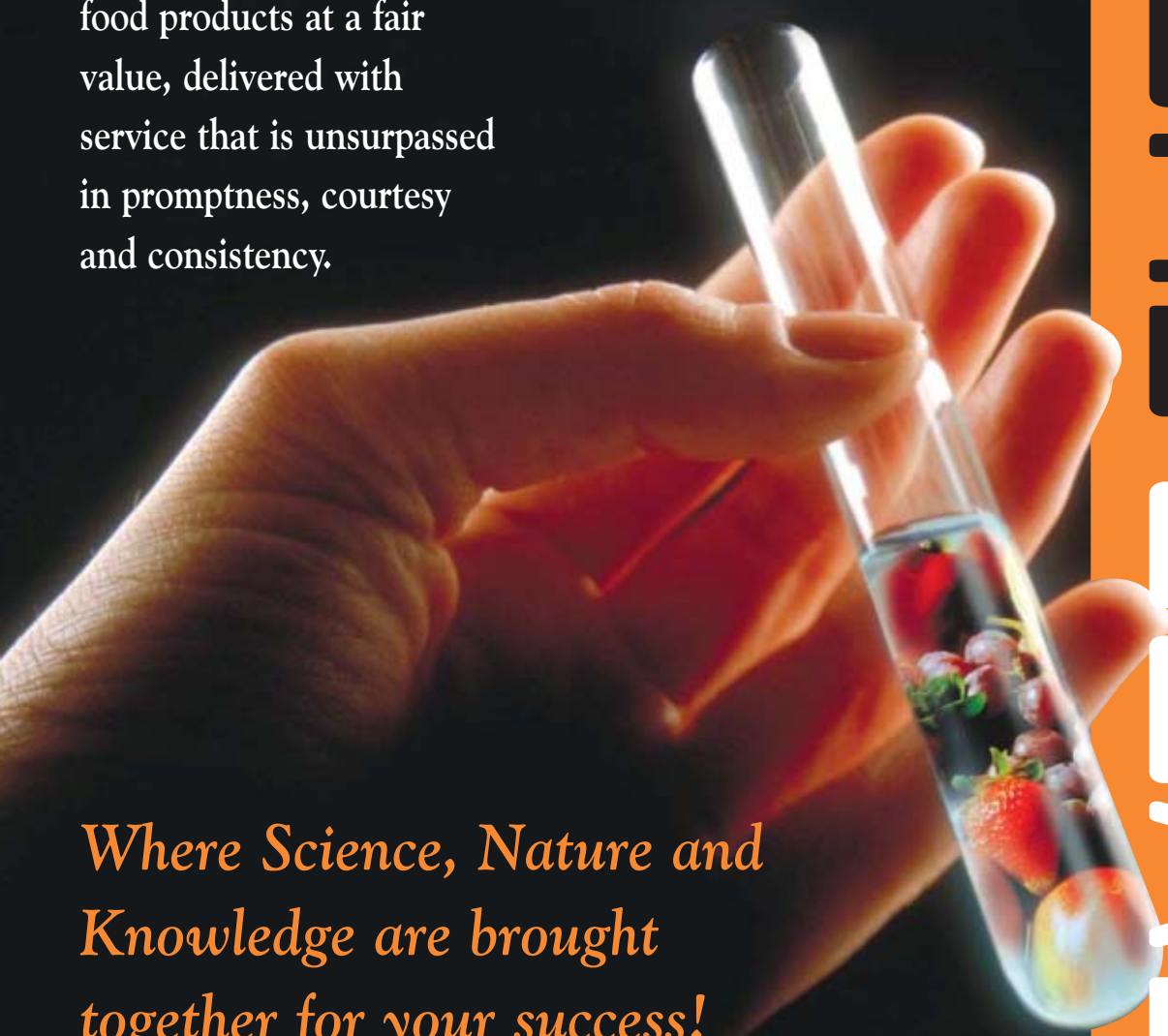

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A new approach to flavor technology contributed to the success of this long-lasting chewing gum launched last year.

Labeling

Even after the chemical properties of ingredients are understood and solutions to flavor degradation have been identified, food manufacturers must still consider labeling implications and requirements.

Labeling should be handled on a case-by-case basis, taking into account the ingredient, the end product and its use. FDA regulations are not always specific for changing technologies and uses of generally recognized as safe (GRAS) food ingredients. "There are some very specific uses allowed for some ingredients and broader ranges for others. Regulatory specialists have become a requirement in the food industry to deal with details involved in correct labeling. In short, each ingredient should be checked for permitted use rates in the food item it is used in, as well as any pertinent regulations for the labeling of said item," advises Rayburn.

A cross-functional team is crucial to determine the best approach for taste preservation over a product's shelflife. In the end, it is all about coming up with great-tasting products that consumers love, using safe and suitable ingredients, packaging, processing and labeling. Pf

Website Resources:

www.icl-perfproductslp.com/page.aspx?id=58 — ICL Sensational Sausage: ingredients to improve taste, texture and health aspects of sausage products

www.innovatewithdairy.com/InnovateWithDairy/Articles/IF_Facts_Yogurt_062905.htm — An article discussing yogurt and other fermented dairy production—different cultures provide flavor variety through lactic acid production

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Of Fats and Oils

Consumer trends show concern about trans fat and interest in omega-3s is still strong. Developers learned about both at *Prepared Foods*' 2006 Applications Seminar.

Soybean Oils: Improved Functionality for Better Health

The soybean industry in the U.S. is guided by a board made up of 22 industry members called QUALISOY™. The group includes farmers, technology companies, soybean associations, academia, industry associations, food manufacturers and food processors.

The group set out to modify the composition of soybean oil. The goals were to reduce linolenic acid levels to a maximum of 3% from the normal levels of 7%-8%, increase oleic acid levels to a minimum of 50% and reduce saturated fatty acids to a maximum of 7%. The targets were established to better meet the needs of oil end-users.

The first enhanced soybean oil to reach the commercial marketplace was low-linolenic soybean oil. It is very stable throughout early shelflife, has no beany/grassy off-note development, is trans-free and has good oxidative stability. The 2007 demand for this product is estimated at one billion pounds. Low-linolenic soybean oil is a viable option for snack food companies and also can be used for basic frying applications in the foodservice arena.

Another product soon to emerge from the research pipeline is increased oleic fatty acid soybean oil that provides a trans fatty acids-free alternative for par-

Suppliers can modify fats using interesterification, a process in which different types of fatty acids—indicated by R1, R2 and so on in the diagram—between oil molecules are exchanged. Fatty acids may be exchanged between molecules of one type of oil or between molecules of different oil types. This is accomplished through use of enzymes or through more traditional processes such as use of catalysts.

Interesterification (Exchange of Fatty Acids Between Oils)

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Source: United Soybean Board

www.PreparedFoods.com / rd

tially hydrogenated soybean oils in applications that undergo high-heat processing. Increased oleic varieties will offer good flavor stability and a tolerance to heating and frying conditions. Varieties with the highest levels of oleic acid can be used as heavy-duty, extended-usage frying oils. Wide consumer acceptance of the Mediterranean diet (which features olive oil, high in oleic acid) has helped drive this program.

A third forthcoming product is a soybean oil variety with higher levels of stearic acid. These high stearate oils will provide food processors with naturally "hard" fats that can be used for different process applications (e.g., margarines, baked and fried foods). Other products that may be produced through modification of soybeans are low-saturate soybean oils, soybean oils with increased omega-3 fatty acids, proteins with enhanced amino acid balance and those that would have higher metabolizable energy.

The immediate drive for modification of soybean oils has been the push to reduce trans fatty acids in the diet. Processors are now looking for trans-free and low-trans alternatives for frying, baking and other processes. Using chemical catalysts or an enzymatic process, unique low-trans or no-trans products may be produced. Interesterification produces products that may contain higher levels of saturated fatty acids, but the combined levels of saturates and trans acids in such products are considerably lower than in a hydrogenated product. Many oil suppliers are, in fact, using interesterification to produce the functional fats so important to baking and other operations (see chart "Interesterification"). This is a process that allows manufacturers to produce modified fats by exchanging fatty acids between oils. Fatty acids may be moved to different positions within an oil molecule or between oils. Interesterification may be done using enzymes or through more traditional processes using catalysts.

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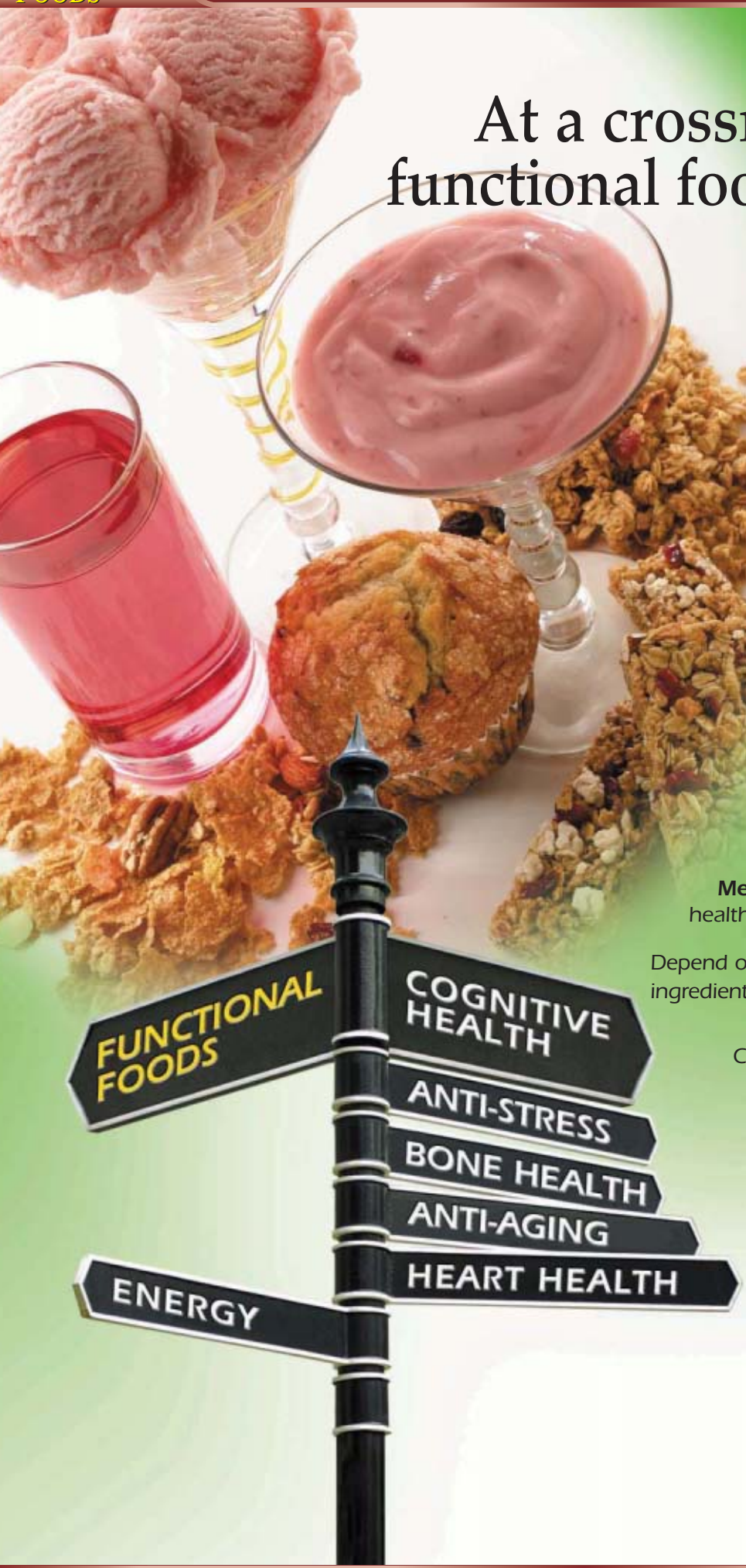

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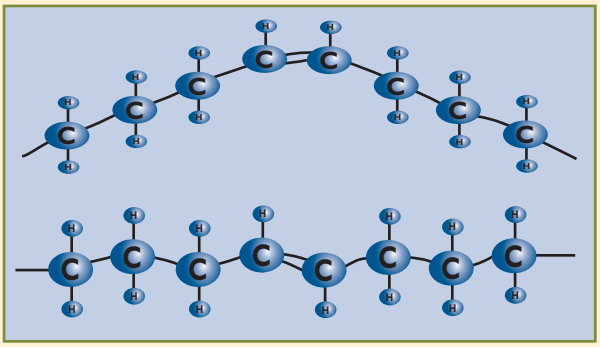
"Enhanced Soybean Oils: Traits for Improving Product Functionality and Human Health,"
Don Banks, consultant for the United Soybean Board and QUALISOY, dbanks@flash.net, www.unitedsoybean.org
—Summary by Richard F. Stier, Contributing Editor

New Soybean Oil Solutions to the Trans Fat Challenges

Today, consumers are very conscious of diet and health, and are especially aware of issues pertaining to fats and oils. They are beginning to understand that certain fats, such as saturated fats and those which contain trans acids, will raise the levels of low density lipoproteins (LDL) or bad cholesterol, whereas products that are high in monounsaturated fatty acids (oleic acids) can provide health benefits

Cis and Trans Molecular Arrangements



Source: Institute of Shortening and Edible Oils, www.iseo.org/ffo_1-4.htm

This chart shows cis (the bent molecule at the top) and trans (the relatively straight one below) molecular configurations. Trans fats are generally more solid than cis fats, but less solid than saturated fats.

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by raising their good cholesterol (high density lipoproteins or HDL) and lowering levels of LDL.

Trans fatty acids are the trans isomers of unsaturated fatty acids. Most naturally occurring unsaturated fatty acids are found in the "cis" form. The "cis" and "trans" forms refer to the position of the hydrogen atoms around the double bonds on the fatty acid chain. These hydrogen atoms are held in place at the double bond. When the atoms are on the same side of the chain, they are referred to as being in the "cis" position; those on opposite sides of the chain are in the "trans" position (see chart "Cis and Trans Molecular Arrangements"). Trans fatty acids occur naturally, but they also are a primary product of a process called hydrogenation, which allows oil processors to produce fats with a wide range of physical functions. Unfortunately, trans fats behave like saturated fats, increasing "bad" cholesterol and enhancing the potential for heart disease. Because of these potential health issues, the USDA has mandated that trans fatty acids be included on the Nutrition Facts panel on all food products.

Without trans or saturated fatty acids, it is difficult for a supplier to formulate fats that create the characteristics consumers like in many foods. Trans fatty acids and saturated fatty acids, such as palmitic and stearic acid, have unique functional properties that allow manufacturers to produce margarines, spreads and shortenings for different pastry products. Products high in mono- or poly-

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unsaturated fatty acids, which are liquid at room temperature, may be healthier, but they do not have the functional properties of the hard fats.

The soybean industry has been actively working to address the sometimes conflicting issues of function and health. Increased oxidative stability can be achieved through low-linolenic or high-oleic soybean oils. As mentioned, interesterification also creates more functional fats and oils.

New and modified soybean oils can be used to produce a wide range of desired end products for specific applications. For example, soybean oils with bland or neutral flavors and light color, as well as high levels of polyunsaturated or monounsaturated oils, are desirable for salad oils. On the other hand, oils used to produce margarines or shortenings should have some saturation, with possible interesterification. pf

"New Soybean Oil Solutions to the Trans Fat Challenge," Pamela J. White, professor, Department of Food Science and Human Nutrition, Iowa State University, The Soyfoods Council, pjwhite@iastate.edu, www.thesoyfoodscouncil.com
—Summary by Richard F. Stier, Contributing Editor

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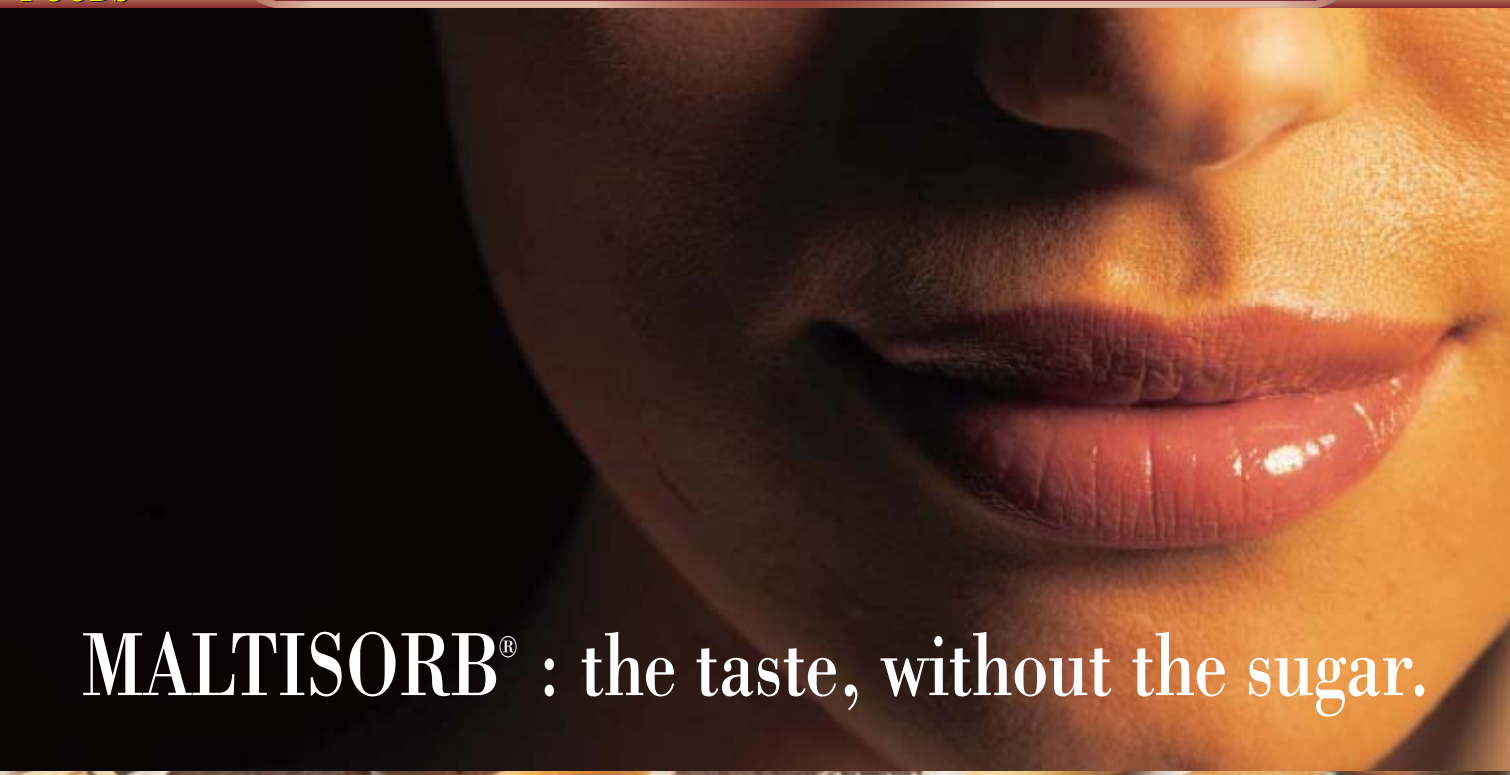

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See Food Master-*INGREDIENTS*, p. 174

Utilizing Nature for Healthy Formulations

Healthy oils for wellness and beauty; using grapeseed extract for antioxidant benefits in dairy products; allergen-free lycopene and beta-carotene; and employing bacteria for food safety are some of the topics explored by attendees of *Prepared Foods*' 2006 R&D Seminars.

Eating for Beauty and Health

Health problems associated with an aging population include heart disease, high blood pressure, certain cancers, diabetes and obesity. Many believe that these diseases are a function of the Western diet, which features too many foods high in fat, empty calories and salt, all of which can further aggravate health problems.

There is a push to get back to basics; that is, to consume more products that are less processed and richer in nutrients. These are called "beauty foods" by some and are characterized by being natural, flavorful without being salted, colorful and high in fiber. Beauty foods improve skin, hair and overall health from the inside out. They include products such as aloe vera, citrus, carrots, wheat germ, flaxseed, tomatoes, cranberries and garlic. These products are high in natural antioxidants and contain phytochemicals, fiber and healthy oils.

Antioxidants protect cells from molecular damage caused by free radicals. Some believe that certain cancers and cardiovascular disease are caused in part by the presence of free radicals. Antioxidants scavenge the free radicals, rendering them harmless. There are a wide range of phytochemicals divided into 10 groups. These groups include polyphenols, carotenoids, monoterpenes (which are the compounds that impart citrus flavor), isothiocyanates, allyl sulfates, indoles, saponins, protease inhibitors and capsaicins. Flavonoids are the plant pigments that impart flavor and color; plus, they are now known to protect against cancer and cardiovascular disease. Flavonoids are found in fruits and vegetables and in other plants not so well-known. Sources of non-traditional flavonoids may be seen in the chart "Non-traditional Flavonoid Sources."

Healthy oils may seem like an oxymoron, but there are fats and oils that contain components that are good for humans. Products that are high in omega-3 and omega-6 fatty acids, such as fish oils and flaxseed oil, have been shown to be beneficial in a number of different ways, including cholesterol reduction and protection against certain cancers. Fiber is essential for good digestion. It helps control weight, can reduce the potential of certain cancers

Flavonoids are plant pigments that have the ability to promote human health by reducing the risk of heart disease and stroke and by lowering blood cholesterol levels.

and reduce heart disease.

The adoption of this kind of diet will help drive a new discipline known as nutrigenomics. This is the systematic study of the biology of nutrition. The theory is that people can eliminate disease by changing their biochemistry, which is in part a function of diet. Consuming more healthy foods and those with specific characteristics will bring about these changes, according to this theory. This would be, in essence, "personalized" or "individualized nutrition," in that it would be based on each individual's genetic makeup. The bottom line is that we are what we eat, and changing eating habits to ensure that one eats a balanced diet that includes fresh fruits, vegetables and healthy sources of oil can do nothing but be helpful.

"Foods for Beauty and Wellness: Nourishing the Body from Within," Jennifer Crouch Elgrim, manager—sensory and consumer research, David Michael & Co. Inc., jelgrim@dmflavors.com, www.davidmichael.com
—Summary by Richard F. Stier, Contributing Editor

Adding Grapeseed Extract to Bakery Products

In winemaking, the skin and seeds of grapes have traditionally been waste products. However, the grape's seed coat is rich in antioxidants, and grapeseed oil is finding its way into more and more upscale kitchens. Grapeseed extract has high antioxidant levels. The concentration process results in an extract that has 50g to 90g of antioxidant per 100g, compared to 3g to 12g in 100g of the seed itself. The concentration of simple sugars in the grapeseed extract is between 10% and 20%, vs. 10% to 12% in the grapeseed (see chart "Components of Grapeseeds and Grapeseed Extract").

The antioxidants found in grapeseed extract are primarily polyphenols. This is the same class of chemicals found in wine. One of the primary compounds found in the extract is oligomeric proanthocyanin. Thanks to this compound and the other polyphenols found in the extract, grapeseed extract has almost five times the antioxidant activity as vitamin C. Other research has shown that grapeseed extract may inhibit skin damage and cancers induced by ultraviolet radiation. It has also been shown to inhibit chemically induced skin cancers and damage to capillaries. Grapeseed extract has shown an ability to inhibit the synthesis and release of substances that promote inflammation and to enhance wound healing. Plus, it is active in minimizing the development of cardiovascular disease. More importantly, animal studies have shown that grapeseed extract is safe for use in foods and beverages.

The concentration process results in an extract that has 50g to 90g of antioxidant per 100g, compared to 3g to 12g in the seed itself.

Human feeding studies have also demonstrated very distinct benefits. Incorporating grapeseed extract into the diet will spare vitamin E and reduce damage to cellular material, enhance visual performance, reduce energy intake, enhance weight management and reduce oxidative damage and depletion of vitamin E that occurs during exercise. Research on products in which grapeseed extract has been incorporated, such as bread, extruded muesli bars and breakfast cereals, has shown that the antioxidants in the extract are quite stable. There is little degradation over time. For example, in muesli bars, the levels of antioxidants drop slightly during the first month after extrusion but remain at the same levels for the next five months.

Consumers are very aware that consumption of

Non-traditional Flavonoid Sources

Chamomile	Milk thistle
Dandelion	Onions
Ginkgo	Rosemary
Green tea	Sage
Hawthorn	Thyme
Licorice	Yarrow

Source: *The American Journal of Clinical Nutrition*, Vol. 70, No. 3, 491S-499S, September 1999

Components of Grapeseeds and Grapeseed Extract

	Grapeseeds	Grapeseed Extract
Antioxidant material (g/100g)	3-12	50-90
Simple sugars (g/100g)	10-12	10-20
Oligosaccharides (g/100g)	75-90	5-30

Source: New Zealand Grape Seed Co. Ltd./Roxlor

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natural antioxidants in the diet can enhance overall health. Grapeseed extract is a product that can be used as an ingredient in different products to provide a source of these compounds.

"Fortifying with Grapeseed Extract," Glenn Vile, Roxlor International, Info@roxlor.com, www.roxlor.com
—Summary by Richard F. Stier, Contributing Editor

Allergen-free Lycopene and Beta-carotene

Lycopene and beta-carotene are unique molecules. Both contain forty (40) hydrocarbons, impart color and act as antioxidants as a result of their extensive system of conjugated double bonds.

Lycopene is a carotenoid with red color found in plants such as tomatoes and watermelon. It is a powerful antioxidant but has no provitamin A activity. Lycopene ingestion has been associated with lower rates of certain cancers and enhanced cardiovascular health. It is proven to be absorbed in clinical studies and scavenges reactive oxygen species, thus minimizing potential damage to the body (see chart "Lycopene Helps Prevent Chronic Diseases").

Beta-carotene is a similar molecule to lycopene, except that is has provitamin A activity. It is also associated with enhanced immune function and reduced oxidative stress. Like lycopene, it can be synthesized, and the synthetic product has similar properties and functions to carotene or lycopene found in our food. It is nature-identical. Beta-carotene has the highest provitamin A activity of all of the carotenoids, and it only takes 3mg to provide 100% DV (5,000IU) of vitamin A per serving.

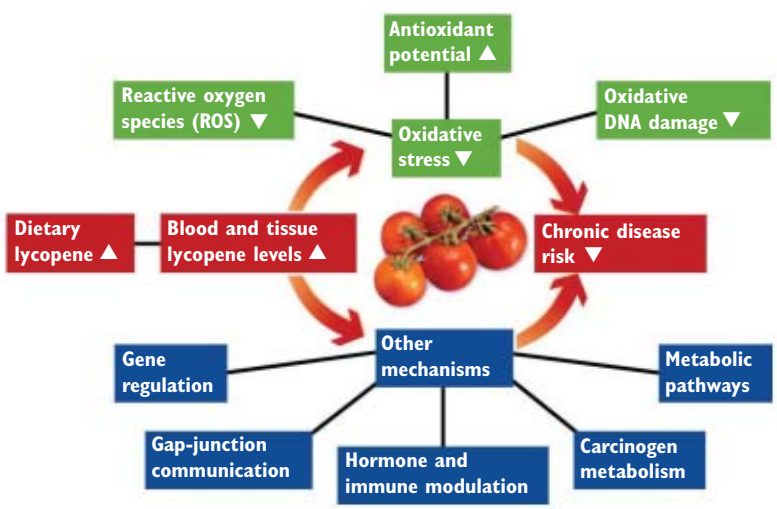
Scientists believe that lycopene's role in enhancing cardiovascular health is as an antioxidant. Lycopene scavenges reactive oxygen species, helping to minimize potential damage to the body.

Since neither lycopene nor beta-carotene is soluble in water, and both are sensitive to oxygen, it is necessary for manufacturers to market these products in a form that is stable and can be used in different foods. Encapsulation of the two compounds in modified starch matrices allows their use in different products and yields a finished product that is non-allergenic and vegetarian. A protein-based encapsulated product cannot make this claim.

The use of encapsulated lycopene or beta-carotene in beverages calls for the use of special processing techniques, the possible use of a stabilizer system and the addition of ascorbic acid as an antioxidant. The primary use of beta-carotene is to impart colors to products in a similar fashion; lycopene also will color the food or beverage to which it is added. One suggested process for addition of carotenoids to beverages would be as follows: 1) slowly mix the powder (encapsulated carotenoids) to water while mixing; 2) allow product to equilibrate for approximately 10 minutes; 3) add a stabilizer system such as gum acacia or pectin; and 4) add ascorbic acid. Carotenoids have excellent stability in products such as soft drinks and still beverages when following recommended processes. Lycopene is GRAS as a nutrient.

There are certain issues of which potential users must be aware. For use in beverages, stock solutions are often required, and there are colloidal stability

Lycopene Helps Prevent Chronic Diseases



Source: Agarwal S., Rao AV. *CMAJ* 2000; 163:739–744

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concerns. Also, because of their sensitivity to oxygen, ascorbic acid is needed as an antioxidant. Finally, the use of carotenoid compounds can create turbidity in a beverage, which can be positive or negative, depending on the nature of the beverage; it is common to use combinations of products to get the desired color and turbidity.

"New Lycopene and Beta-carotene Products for Allergen-free Functional Beverages and Foods," John L. Foley, technical services manager, BASF, John.Foley@basf.com, www.human-nutrition.basf.com
—Summary by Richard F. Stier, Contributing Editor

Bacteria Help Ensure Food Safety

The number one priority for all food processors is food safety. To ensure the safety of processed foods, manufacturers have worked to eliminate or reduce microorganisms in ingredients, the processing environment and in finished products. Beneficial bacteria also can be used as a means to inhibit or eliminate pathogens. The utilization of bacteria as a means to control pathogens is called bioprotection.

One of the best examples of how beneficial bacteria work is in fermented foods. Dairy products (such as cheese, yogurt or sour cream), fermented sausages and vegetable products (such as olives or pickles) have a very good health record. Bioprotection controls pathogens and, at the same time, enhances food quality by delaying the growth of spoilage bacteria. The incorporation of microorganisms or their by-products adds an additional hurdle to foods, which can further protect the product from pathogens and/or spoilage.

Bioprotective cultures work by competing with and inhibiting indigenous microflora. They compete for nutrients, remove oxygen (thereby lowering the redox potential of the food) and grow well under normal conditions of distribution and storage. These cultures also can produce substances that inhibit pathogen growth, such as organic acids and bacteriocins.

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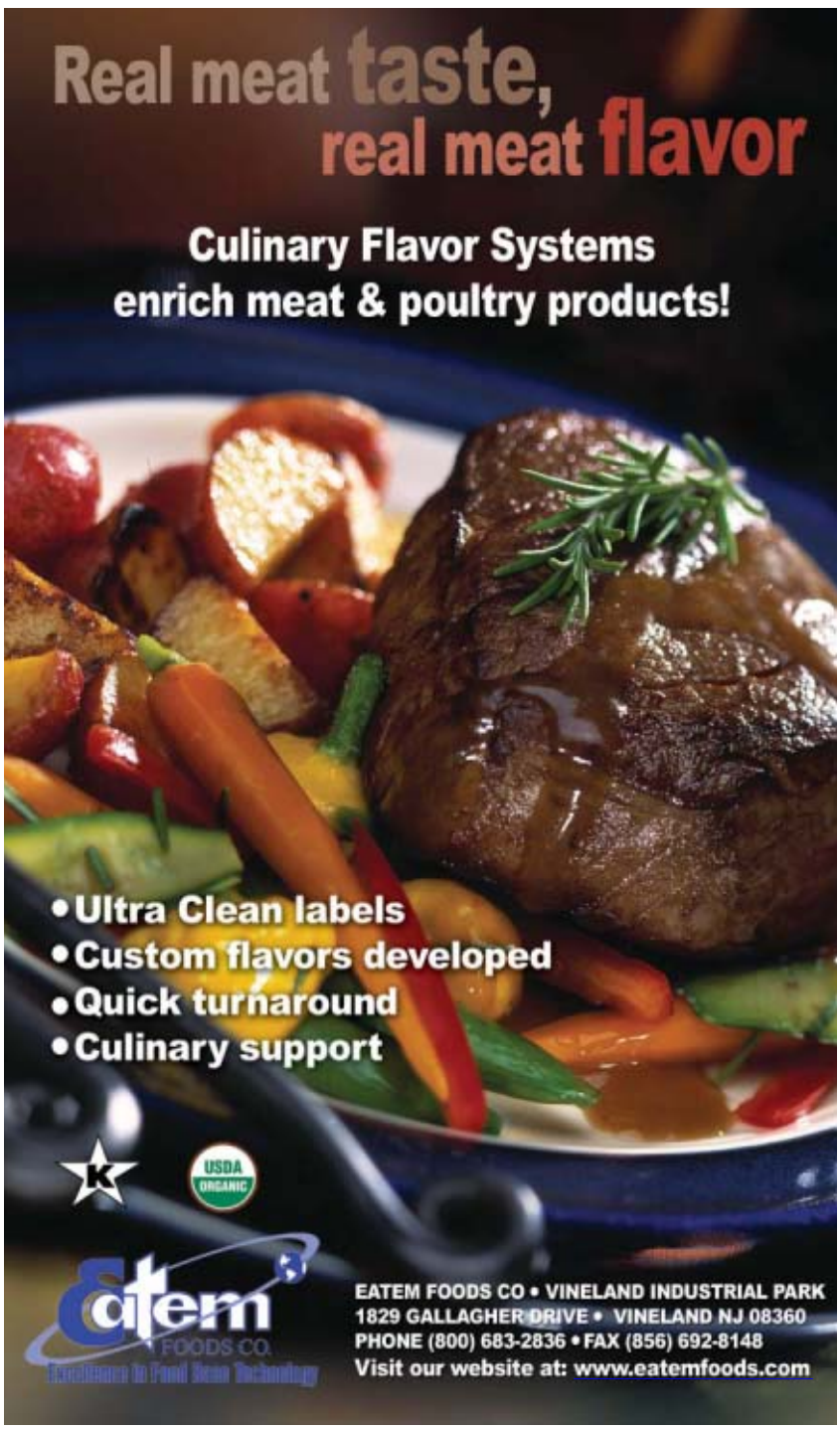
Since the main bioprotective organisms are lactic acid bacteria, the main acid produced is lactic acid.

Perhaps the most well-known application of bioprotection is in the meat industry. *Lactobacilli* and *Pediococci* are used to ensure proper fermentation and safe production of fermented products. The latter also may be used as an adjunct culture for controlling *Listeria* sp. in existing products. These organisms may also be used in non-fermented products, such as bacon, to inhibit spoilage organisms. Research using meat emulsions inoculated with *Listeria monocytogenes* has shown that the addition of bioprotective cultures to fermented sausages will not only significantly reduce numbers of *Listeria* in the product (2–3 log reduction), but also will prevent their growth, primarily through the production of bacteriocins. The addition of *Lactobacilli* and *Leuconostoc* to fresh meats will suppress the growth of *Listeria monocytogenes* through competitive exclusion and the production of organic acids inhibitory to growth. In cooked meats, inhibition is achieved through competitive exclusion and the presence of bacteriocins. These organisms may also be used to slow the growth of spoilage bacteria, thus improving shelflife.

Bioprotective cultures offer many advantages, but there are also some drawbacks. They require an extra processing step, which can increase costs. They are also application-specific, and the regulatory status is not clearly defined. What may be the biggest obstacle is that the addition of bioprotective cultures will raise the total microbial counts, which can create issues with customer specifications. However, they are a natural means of ensuring human health. pf

"Increasing Food Safety Through the Use of Beneficial Bacteria," Jim Lamkey, senior technical services specialist-meat and poultry, Chr. Hansen, usjil@chr-hansen-com, www.chr-hansen.com
—Summary by Richard F. Stier, Contributing Editor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Natural Antioxidant Extracts

Kerry Hughes, R&D Applications Editor

People may be more acquainted with the herb rosemary than they think. Rosemary has a long tradition as a spice for foods, bringing its piney, pungent, minty and sweet flavor characteristics to a variety of dishes, including meats, soups, salad dressings and sauces. However, today one of its primary uses in prepared foods is as a natural preservative due to its powerful antioxidant properties. Most people never notice its presence, due to its labeling as a natural flavor.

Oil-soluble rosemary extracts have been used since the 1990s in the food industry as natural preservatives in meats and other oil-soluble food matrices. However, today, water-soluble rosemary extracts are gaining in popularity, due to their functionality in a variety of water-soluble applications such as salad dressings and natural and functional beverages. Water-soluble rosemary extracts are manufactured by Naturex Inc., under the brand names StabilEnhance® WSR, ColorEnhance® and Flavor'Plus™. Water-soluble rosemary extracts contain rosmarinic acid, which is a natural hydrophilic phenol. Other companies may carry WSR, but only Naturex has WSR products that are specific to protecting color and citrus flavor degradation (U.S. patents #5,908,650, WO9714319 and #6,306,450).

The antioxidants' light, fresh flavor notes make them appropriate for many applications.

StabilEnhance is standardized up to 20% rosmarinic acid, organic-compliant and GRAS. It is used to mitigate the deterioration of flavors in beverages. It has a fresh tea-like note that allows its use in many applications. In soft drinks, StabilEnhance can extend the freshness of the flavor and color stability during storage. In lager beers, it can enhance freshness and maintain the original flavor. StabilEnhance imparts a dual benefit for tomato-based products, both protecting the color of the tomato and also preserving lycopene content over time.

Flavor'Plus is primarily used with flavors to maintain freshness and delay the degradation of the flavor. Both Flavor'Plus and StabilEnhance WSR can be used with high carotenoid applications to prevent color loss and off-flavors. Salad dressings and meats also benefit from the use of Flavor'Plus by helping them to maintain freshness, and in meats, it has the added benefit of bringing a fresh typical herb flavor.

The addition of 500ppm of one of the company's proprietary water-soluble rosemary extracts helps to protect the lycopene content over two and a half hours longer than the control.

ColorEnhance is specific for allowing the increased stability and enhanced color in products containing anthocyanins. Through an action of copigmentation, it is able to actually deepen and intensify the natural color. ColorEnhance also imparts a fresh tea note and is compatible with many applications.

"One of the best things about Naturex water-soluble rosemary, besides being all-natural, GRAS and suitable in organic applications," adds Antoine Dauby, marketing manager for Naturex, "is that it is also label-friendly, in that it only needs to be identified as a natural flavor." Pf

For more information:
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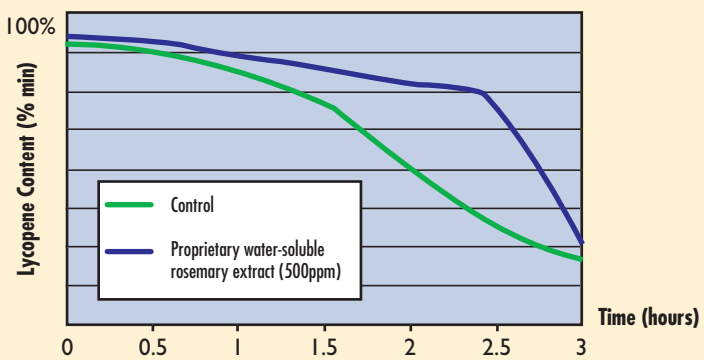

Source: Naturex Inc.

Gluten-free Looking Good

Kerry Hughes, R&D Applications Editor

According to a report called "Gluten-free Foods and Beverages" (July 2006) by Packaged Facts, the publishing division of MarketResearch.com, the market for gluten-free foods is growing somewhere between 25%-27% annually. One of the big challenges in formulating gluten-free products is achieving the same colors, flavors and textures as regular foods.

In many products, wheat, barley, rye and related grains are essential in providing specific flavors, colors or functions that cannot easily be duplicated by substituting corn, rice or other celiac-safe grains or starches. This is especially problematic for many of the daily staples enjoyed by non-celiacs, such as baked goods, bars, breakfast cereals and beer. "For most baked goods and cereals, the natural browning that occurs during the cooking processes are, in large part, responsible for the color and flavor of the product," explains Bob Hansen, manager of technical services for Briess Malt & Ingredients Company. "Most alternatives to wheat flour and malt extract lack the natural reducing sugars, proteins and amino acids needed for sufficient browning." For this reason, Briess has developed BriesSweet™ White Sorghum Syrup as a gluten-free malt extract substitute. The product is a grain sorghum syrup that is enzymatically produced from the starchy heads of the grain, not the cane, of the sorghum plant.

Botanical relationships help predict which grains may cause sensitivity in celiacs.

A viscous, golden liquid with a mild, pleasant grain flavor, grain sorghum syrup also can be used to supply color and flavor. "BriesSweet White Sorghum Syrup was originally developed for making gluten-free beer," Hansen adds. "There are many sugars that can be fermented to make alcohol, but none of them have a color or flavor anything like malted barley." Other sugars also lack the amino acids and minerals needed for proper yeast growth. Unrefined syrups such as malt extract and sorghum syrup are the most nutritious of all natural sweeteners, containing some of the original vitamins and minerals of the grain as well as proteins and amino acids.

BriesSweet White Sorghum Syrup (WSS) is available in either 45DE (dextrose equivalent), High Maltose or 60DE. It can be substituted for the equivalent type (DE) of corn syrup in many types of applications such as bars, granolas, certain sauces and chocolate-flavored products. Both are hypoallergenic, non-GMO, kosher-certified and all-natural, made with 100% pure grain sorghum.

Hansen concluded, "There are new benefits of this new class of sweeteners, depending on the finished application. Not only do they provide humectancy, sweetening, increased viscosity and the other benefits of traditional starch-based sweeteners, but they can also provide improved flavor and color and increased nutrition while maintaining a clean, all-natural, non-GMO and hypoallergenic label." pf

For more information:
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Ann Heus • 920-849-7711
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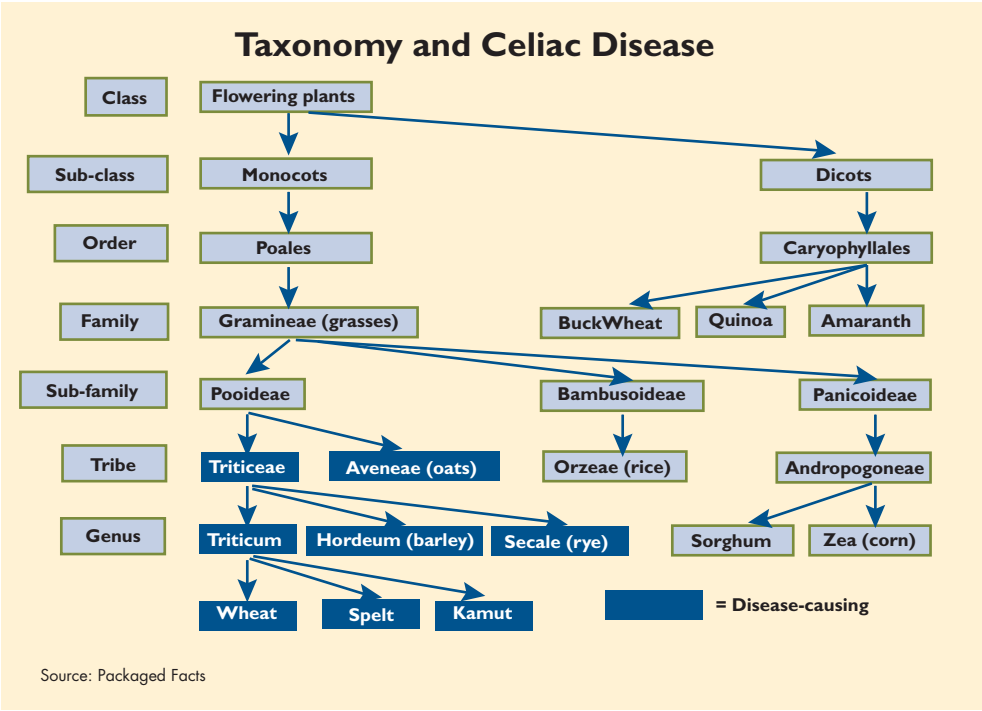

Source: Packaged Facts

INNOVATIVE FORTIFICATION > CUSTOM PREMIXES > BLENDING

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Cooperative Texturizers

Designed specifically for dairy systems, National Starch created four new N-DULGE™ Texturizers to provide manufacturers with versatile, easy-to-use tools to develop indulgent textures. The first in a line of novel texturizers that the company is launching in the next several years, N-DULGE products are what the company calls co-texturizers. This concept involves a standard, base viscosifier as the texture foundation and adds a non-viscosifying co-texturizer to provide sensory attributes such as slow or even meltaway, full mouthcoating and other desired traits. National Starch Food Innovation, David Manion, dave.manion@nstarch.com, www.foodinnovation.com

Trans-free Bakery Shortening

Health professionals recommend that consumers keep dietary saturated fat intake as low as possible. SansTrans RS39 T20, developed by Loders Croklaan, provides excellent baking results—even though it contains 30% less saturated fat than traditional trans-free bakery shortenings. Other advantages include lower cost compared to other reduced-saturate shortenings, oxidative stability similar to traditional bakery shortenings and improved processability compared to other reduced-saturate shortenings. It is not hydrogenated, contains 100% vegetable oil and is kosher. Loders Croklaan, 800-621 4710, fats.lc@croklaan.com, http://northamerica.croklaan.com

Enhanced Flavors Through Beer Extract

Delivering hearty beer flavor, Dried Beer Extract from Butter Buds Food Ingredients has the natural taste of beer in an easy-to-use, spray-dried from. It is convenient for use in snack seasonings, processed meats, soups, sauces, etc., without concern over safety, licensing, refrigeration, handling and cooking time. It enhances sweet flavors in confections, savory flavors in meats and provides full-leavened taste in bakery. Butter Buds Food Ingredients, William A. Buhler, 262-598-9900, bbuhler@bbuds.com

Clean Labels Through Oxygen Removal

Organic food manufacturers face the challenge of ensuring the quality of their packaged products throughout supply chains. Multisorb Technologies offers a set of sorbent solutions that preserve freshness by controlling oxygen and moisture levels within the packaged environment. Proactive oxygen scavenging removes oxygen, maintaining food qualities that otherwise would require additives and prevent a clean label status. Moisture also is regulated to ensure the product does not become too dry or moist. Multisorb Technologies, John F. Solomon, 972-540-1797, jsolomon@multisorb.com pf

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ADM

To meet the increasing demand for healthy and nutritious products, ADM applies its expertise to the processing of food crops from around the world, identifying and extracting compounds that have proven health benefits. ADM offerings include mixed tocopherols, natural-source vitamin E, phytosterols, soy isoflavones, soy proteins and more. Using these ingredients, ADM works with customers to develop high-performing and great-tasting functional foods, beverages and dietary supplements.

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Fibersol-2 digestion resistant maltodextrin is a product of ADM/Matsutani LLC, a joint venture of Matsutani America and Archer Daniels Midland Company, both of Decatur, IL, USA. Inquiries are invited at +1 217-451-4377 or www.matsutaniamerica.com.

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American Egg Board

American Egg Board (AEB) is the U.S. egg producers' communications link to food processors. As the egg industry's promotional organization, AEB works to educate manufacturers and developers of new food products about the functionality and nutritional benefits of eggs. The egg is still one of nature's most perfect foods and can help make other foods perfect, too. In fact, eggs perform multiple functions in the making and processing of foods, while simplifying the ingredient statement. AEB develops and distributes resource materials to assist product developers, shares timely tips and trend information through a quarterly newsletter and a monthly e-newsletter, and also makes available egg product experts to answer technical questions.

For more information about American Egg Board promotional efforts and activities, or facts on egg products, nutrition, technical specifications and formulas, visit us at our web site: www.aeb.org.

For further information, contact:
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- Excellent long-term stability
- Proven health benefits for overall vitality

Cognis' ever-expanding portfolio also includes: Betatene® Natural Mixed Carotenoids, Covitol® Natural-Source Vitamin E, and Covi-ox® Natural Antioxidants.

Give your products a healthy competitive edge with **Newtrition**. Only from Cognis. **Stop by Cognis Booth #23035 at SupplySide West.**

For further information, contact:
Sharrann Simmons
708-579-6204
Sharrann.simmons@cognis.com
www.cognis.com

cognis. we know how

Corn Products International

At the 2007 IFT Food Expo, Corn Products International provided samples of Snowflake® Modified Starch for Beverage Emulsions in the form of acai-flavored and carbonated citrus beverages to highlight the starch's excellent ability to stabilize flavor emulsions.

This waxy, corn-based modified starch has emulsifying properties that make it particularly well suited for stabilizing oil-based ingredients in beverages, while also providing a cloudy appearance. Snowflake® Modified Starch's consistent performance eliminates the need for emulsifying gums. It offers complete solubility in cold water – making it perfect for instant applications.

Corn Product International has 35 facilities in 15 countries, providing local service and resources around the world. We also offer a full line of innovative ingredients to meet your formulations needs whenever and wherever you are. Contact us today to find out more about Snowflake® and our complete line of ingredients.

A world of ingredients. A world of ideas.

For further information, contact:
Corn Products International
5 Westbrook Corporate Center
Westchester, IL 60154
800-443-2746
www.cornproducts.com

CornProducts INTERNATIONAL

Danisco

The breakfast table is changing. Today's consumers want jams and jellies with spreadable texture, lower sugar, better fruit identity and more fruit flavor.

Texture was the main focus when Danisco took on these challenges, but flavor quickly became the strongest selling attribute. The GRINDSTED® Pectin SF EXTRA range delivers all the textural requirements, including spreadability, no syneresis, fruit identity and excellent fruit suspension. But the flavor release is truly revolutionary.

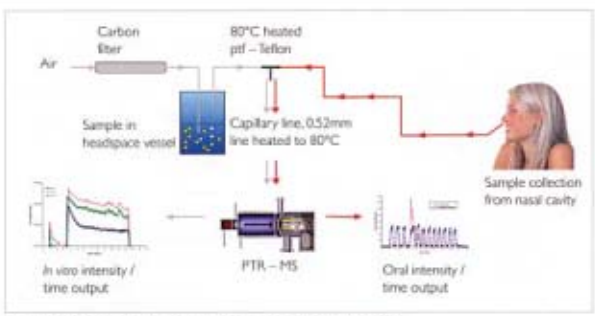

Carbon filter
Air
80°C heated ptf – Teflon
Sample in headspace vessel
Capillary line, 0.52mm line heated to 80°C
Sample collection from nasal cavity
In vitro intensity / time output
PTR – MS
Oral intensity / time output

Figure 3. Experimental set up for *in vitro* and in-nose analysis by PTR-MS.

Danisco utilized in-house laboratories to collect data to validate the impact of pectin gel structure on flavor perception. Analysis included proton transfer reaction–mass spectrometry (PTR-MS), sensory evaluation and texture profiling. PTR-MS allows for monitoring flavor release during the real time sequence of eating.

Two factors that influence perception of aroma compounds are the chemistry of the flavor molecule and the food matrix.

Twice the flavor impact was documented in lower sugar jams containing GRINDSTED® Pectin SF EXTRA than traditional spreads with typical pectin.

The findings of the PTR-MS were verified with trained sensory panelists. The difference in spreadability was documented by creep analysis.

To receive a copy of the full report or to obtain a sample of GRINDSTED® Pectin SF EXTRA contact your Danisco representative at 1-800-255-6837.

DANISCO
First you add knowledge...

David Michael & Co.

"HIT YOUR FLAVOR TARGET FASTER."®

The year was 1896, and David Michael made his first flavor, Old Time Body and Age®. Our product line continues to grow, now including over 35,000 flavors, stabilizers and colors. While many things in our industry have changed, our corporate mission has remained the same: to satisfy the requirements of our clients through a commitment to quality, service, innovation and technology.

Well known in the industry for our expertise in the field of vanilla, our core strengths go much deeper to include other flavor types such as fruit, nut, savory, sensation and masking. David Michael also offers clients assistance with total product development, utilizing the experience of our creative technical staff, along with our modern, state-of-the-art applications laboratories and pilot plant. With facilities in the US, Mexico, France and China, David Michael is well positioned to help you hit your flavor target faster!

For further information, contact:
David Michael & Co.
Total Customer Satisfaction
10801 Decatur Road
Philadelphia, PA 19154
1-800-DM-FLAVORS
web: www.dmflavors.com

DAVID MICHAEL & CO.
Hit Your Flavor Target Faster®

The Dow Chemical Company

Bringing together the strengths of The Dow Chemical Company and Wolff Walsrode, Dow Wolff Cellulosics is a leading supplier of advanced food ingredients derived from cellulose, a natural resource.

Dow Wolff Cellulosics offers customers the best of both worlds, such as an expanded product range that includes methylcellulose (MC), hydroxypropyl methylcellulose (HPMC) and carboxymethylcellulose (CMC). In addition, we are proud to offer expertise in a wide variety of applications and formulations, and dedicated technical support to help you solve your formulating challenges.

Our products provide a wide variety of tasks, such as thickening, stabilizing and emulsifying, and can also be used to replace eggs, fat and gluten in healthy formulations. Our FORTEFIBER™ Soluble Dietary Fiber products have also been shown to help maintain normal levels of blood glucose, insulin and cholesterol in healthy individuals. With production and research facilities in the United States and Europe, we are able to effectively serve customers globally. To learn more about Dow Wolff Cellulosics and our range of solutions for the food industry, please contact:

The Dow Chemical Company
Dow Wolff Cellulosics
100 Larkin Center
Midland, MI 48674
Toll-free: 800-488.5430
Fax: 989-638-9836
foodgroup@dow.com
www.dowwolffcellulosics.com

dowwolff CELLULOSICS™
DOW

ENRECO Inc.

ENRECO pioneered the development of stabilized flaxseed products, rich in omega-3s, fiber, antioxidants and other nutritional benefits. Through our **Gold Standard Quality** process, we have developed "triple cleaned", shelf stable and ground whole-grain flaxseed ingredients as part of our ingredient portfolio.

Our 2007 new product is **FLAX-IT!** flaxseed nuggets – a convenient and attractive way of adding the flavor, texture and nutrition of flaxseed to a variety of food applications. It is gluten-free with an attractive piece identity that comes in several flavors.

ENRECO manufactures conventional and certified organic, stabilized ground, whole-grain flaxseed flours and flaxseed oils, along with stabilized whole grain sorghum and stabilized legume flours plus other ingredients for the baking, pizza crust, breakfast cereal, nutrition bar, toppings and other segments of the food and nutritional products industries.

For further information, contact:
ENRECO Inc.
Chad Boeckman – National Sales Manager
5703 County Road U
Newton, Wisconsin 53063
800-962-9536
920-726-4221 phone
920-726-4224 fax
www.enreco.com

ENRECO
NATURAL INGREDIENT SOLUTIONS–TRUSTED SOURCE

Fortitech, Inc.

Fortitech is the world leader in the development of custom nutrient premixes for the food, beverage and pharmaceutical industries. Fortitech is expert in delivering multiple nutrients in a single blend while preserving three key elements of successful premixes: taste, stability and texture. Key to our strategy is developing formulations using functional ingredients that serve a dual purpose, i.e., delivering a health benefit while also providing processing advantages. Fortitech has facilities in the United States, Europe, Asia Pacific, South America and Mexico. *Not just premixes…Strategic Nutrition.* For more information:

For further information, contact:
Fortitech, Inc.
Riverside Technology Park
2105 Technology Drive
Schenectady, NY 12308
Phone: 518.372.5155
Toll Free: 1.800.950.5156
Fax: 518.372.5599
info@fortitech.com
www.fortitech.com

FORTITECH
STRATEGIC NUTRITION

The Garlic Company

Since 1980, The Garlic Company has been committed to providing the finest California grown garlic as well as responsive customer service to a wide range of retail, foodservice and industrial customers. Because garlic is all we do, we have the knowledge and expertise to do it right. We control the quality of our product every step of the way - from seed to finished product. When you choose The Garlic Company, you can be sure you're getting the quality you expect and the personal attention you deserve.

The Garlic Company was one of the first companies to commercialize the process of peeling whole garlic cloves and packaging them for foodservice and industrial markets. As a natural extension of this whole peeled garlic business, The Garlic Company manufactures refrigerated and frozen garlic slices, dices and puree.

The Garlic Company has also developed a state-of-the-art process for creating shelf-stable garlic puree in vinegar, crushed garlic in citric acid and garlic juice. This processing capability has allowed the company to co-pack as well as sell direct to some of the largest U.S. food manufactures.

For further information, contact:
The Garlic Company
18602 Zerker Road
Bakersfield, CA 93314
Ph: 661/393-4212
Fax: 661/393-9340
tlane@thegarliccompany.com
www.thegarliccompany.com

the garlic company
Premium garlic for more than 20 years.

Gold Coast Ingredients, Inc.

Gold Coast Ingredients is a high quality manufacturer of flavors, custom color blends and specialized ingredients serving the food, nutrition, functional food and nutriceutical industries. We offer custom designed masking agents and flavoring systems for all forms of products. We provide preliminary application testing, custom flavor formulations with quick turn-arounds and offer customer directed formulation parameters i.e. non-GMO, organic, spray-dried, preservative-free, etc.

As an independent producer, Gold Coast Ingredients also offers our clients low minimums, short lead times and floor stocked inventories to help facilitate your manufacturing process. Our plant in Los Angeles, California is Kosher Certified, Organic Certified and AIB Superior rated.

Gold Coast Ingredients is big enough to handle any client's needs but small enough to still care.

For further information, contact:
GOLD COAST INGREDIENTS, INC.
2429 Yates Avenue
Commerce, CA 90040
800-352-8673
323-742-8935
Fax: 323-724-9354
Email: info@goldcoastinc.com
Contact name:
Michele Trent
Corporate Sales Manager
Jon Wellwood
General Manager
Website: www.goldcoastinc.com

GOLD COAST™
ingredients, inc.
Flavor Fusion®

Grain Processing Corporation

Grain Processing Corporation (GPC) is the largest, most dependable producer of MALTRIN® maltodextrins and corn syrup solids. These products are cold-water soluble, low viscosity, readily digestible glucose polymers which provide an excellent source of carbohydrates for nutritional and sports products. Along with PURE-DENT® corn starch NF, Spress® pregelatinized starch NF and INSTANT PURE-COTE® modified starch, these products provide functionality as binders, film formers, diluents and carriers for tablets, powders, granules, coatings or liquids. GPC's line of specialty carbohydrates continues to expand to meet the changing requirements of our customers. TruBran® corn bran is an excellent source of fiber and is easily incorporated into snacks, cereals, baked goods, nutritional bars and other fiber-fortified foods.

GPC is committed to finding effective solution for any problem – large or small. Looking for a way to deliver that healthy edge? GPC has the solution.

For further information, contact:
Grain Processing Corporation
1600 Oregon Street
Muscatine, Iowa 52761
Phone: 563-264-4265
Toll Free: 1-800-448-4472
Fax: 563-264-4289
E-mail: sales@grainprocessing.com
Web Site: www.grainprocessing.com

Where Innovation Comes Naturally
GPC®

Imperial Brands

New Culinary Wine Reductions of Perfection by Imperial Brands Gourmet & Specialty Division

Imperial Brands, formerly known as Todhunter / Monarch, offers a line of Culinary Wine Reductions available for industrial food processing and foodservice. Varieties of 10 - fold Wine Reductions include Red Port, Sherry, Burgundy, Chablis, and Sweet Marsala as well as a Balsamic Vinegar Reduction 3-fold. The company has winery, vinegar, distillery and bottling operation in locations including Florida and Kentucky. These wine reductions have no added salt or sugar, excellent for low-sodium applications. Imperial reductions are alcohol free & all natural, available kosher or shelf stable.

Finally, a winery has replicated the culinary technique of wine reductions for use in the food processing and foodservice industries. Imperial Brands and its Florida Distillers processing plants is the leading supplier of specialty vinegar, beverage & cooking wine, and denatured spirits to the food industry.

The winery is reducing wines by the traditional method in a large batch proprietary process that captures the essential desired characteristics of the reduced wines. This is a tedious time, temperature, shear process that is computer controlled to insure remarkable consistency batch to batch. There is a great savings in time and labor, while delivering a consistent high quality end result. Packaging is 5-gallon pails and 55-gallon drums with refrigerated storage suggested.

Imperial Brands Wine Reductions have industrial food processing applications in soups, sauces, entree, marinades, condiments, specialty food products and flavor production. Imperial Brands products offer great savings, consistent quality, and affordability to a wide range of food operations.

For further information contact Imperial Brands:
sales@ibrandsinc.com
Jim Polansky
Sales Manager
Ph (561) 373-6418
JPolansky@ibrandsinc.com

IMPERIAL BRANDS
GROUPE BELVÉDÈRE

InterHealth Nutraceuticals, Inc.

InterHealth Nutraceuticals is known for its scientific research on innovative, value-added ingredients, along with the knowledge to apply it and the intellectual property to protect it.

InterHealth features Super **CitriMax®** and **ChromeMate®**, the smart choices that help food and beverage manufacturers develop turnkey solutions for products based on the latest scientific findings and trends.

Super CitriMax is a unique, patented form of (–)-hydroxycitric acid (HCA) bound to calcium *and* potassium. It is the only all-natural GRAS-affirmed HCA ingredient clinically proven to help consumers consumer 25% fewer calories and, at clinical strength doses, burn 32 – 107% more fat than diet and exercise alone. Super CitriMax is highly soluble and heat- and shelf- stable. Virtually tasteless, odorless and colorless, it is an excellent choice for weight management and lifestyle products, including beverages, dairy products, cereals and snacks.

ChromeMate® is a patented GRAS-affirmed niacin-bound chromium complex that helps to promote healthy blood sugar levels and normal body weight, especially in individuals who are diabetic or obese. It is clinically proven to reduce fat while promoting lean body mass. ChromeMate has been shown to be absorbed *and* retained at significantly higher levels than any other dietary chromium complex tested.

Manufacturers often formulate Super CitriMax and ChromeMate together to produce a potent combination for effective weight management and healthy living.

For further information, contact:
Robert Worsena
Director of Sales - Food & Beverage
InterHealth Nutraceuticals, Inc.
5451 Industrial Way
Benicia, CA 94510
(724) 742-2009
(800) 783-4636
rworsena@interhealthusa.com
www.interhealthusa.com/beverage

International Dehydrated Foods, Inc.

International Dehydrated Foods, Inc. (IDF™) is a world leader in the development, processing, and distribution of natural meat and poultry-based food ingredients that include spray-dried meat and poultry powders, chicken fat powders, broth powders, powdered combinations of chicken broth and fat, 32% (37 Brix) frozen chicken broth, and shelf-stable liquid chicken fat.

We are excited to introduce five new items to our line up of "*Natural*" products, a Premium Chicken Broth, two Powdered Beef Broths, a Powdered Beef Fat, and a powdered Beef Fat and Broth combination. In addition to our exceptional base broths, we can now offer a Premium Chicken Broth (Item No. 3813), a rich, concentrated, base that has been processed to maximize mouth-feel and chicken flavor. Our two new IDF® Powdered Beef Broths offer two distinct profiles. You can now choose a "fine" tan powder (Item No. 5402) with light roasted notes, or an agglomerated version (Item No. 5403) with an intense/strong roasted note in a rich brown powder form. Our new IDF® Powdered Beef Fat (Item No. 5761) offers a rich cream color, smooth mouth feel, and light roasted beef notes. Our new IDF® Powdered Beef Fat and Broth (Item No. 5760) has a rich bold flavor with a smooth mouth-feel.

Our meat and poultry products have been the preferred choice of food companies focused on providing the consumer with food that truly tastes good. IDF products offer the most flavorful, cost-effective formulations for seasoning blends, flavors, bouillon, soups, sauces, gravies, marinades, batters, breading, stuffing mixes, and snacks.

For further information, contact:
Customer Service
International Dehydrated Foods, Inc.
P.O. Box 10347
Springfield, MO 65808
Phone: 417-881-7820
Fax: 417-881-7274
E-mail: customerservice@idf.com
Web Site: www.idf.com

International Fiber Corporation

International Fiber Corporation gives you many ways to improve your products using one of our many fiber ingredients – including Solka-Floc®, JustFiber®, and NutraFiber® brands. International Fiber is also the North American distributor of Fibrex® Sugar Beet Fiber. We can assist you whether you are trying to make a fiber claim, reduce calories, or need the functionality that fiber can offer. Our fibers meet National Formulary (NF) specifications and make excellent excipients and binders for tableting applications. Let International Fiber help you improve your new product success!

For further information, contact:
International Fiber Corporation
50 Bridge Street
North Tonawanda, NY 14120
888-698-1936
716-693-3528
info@ifcfiber.com
www.ifcfiber.com

Kalsec®

Kalsec® is a privately held producer and marketer of natural extracts for use in food, beverage, and pharmaceutical applications (www.kalsec.com).

Kalsec® introduced ZeaGold™ natural zeaxanthin to the nutritional food, beverage and dietary supplement market in 2006. Zeaxanthin (zee-uh-ZAN-thin) is a carotenoid pigment which scientific evidence indicates may be important in reducing the risk of cataract formation and age-related macular degeneration (AMD), the two most prevalent chronic eye diseases.

The source of Kalsec®'s ZeaGold™ natural zeaxanthin is unique. ZeaGold™ is produced by concentrating zeaxanthin pigments from a common food source, paprika. It is the only source of zeaxanthin on the market today that is natural, generally recognized as safe (GRAS), and exempt from certification under the code of federal regulations (CFR) color additive regulations.

Kalsec®markets ZeaGold™ zeaxanthin under a patent licensing agreement* with ZeaVision LLC. This agreement provides a 'pass through' license to buyers of Kalsec® ZeaGold™ zeaxanthin. Customers marking dietary supplements, nutraceuticals, drugs, and functional food products will have a royalty-free license on items containing zeaxanthin in dosages up to and including 4 mg.

Founded in 1958, the company is headquartered in Kalamazoo, Michigan, with facilities in Kalamazoo, Michigan, Denver City, Texas and Mildenhall, England. For more information, visit www.kalsec.com.

For further information, contact:
KALSEC®
(800)323-9320 or (269)349-9711
FAX: (269)382-3060
info@kalsec.com
Carol Locey
Director, Product Management – Colors and Zeaxanthin
P.O. Box 50511
Kalamazoo MI 49005-0511
www.kalsec.com or www.zeagold.com

Lonza Inc.

Lonza is one of the world's largest suppliers to the pharmaceutical, healthcare and life science industries.

Lonza offers FiberAid® prebiotic, a naturally occurring water soluble polysaccharide. It is the solution for food manufacturers who not only want to add nutritionally significant amounts of dietary fiber to their functional foods and beverages without jeopardizing taste, color, aroma or mouthfeel, but seek to offer products with digestive health benefits. FiberAid® prebiotic is produced exclusively by Lonza using a patented water-based, solvent-free manufacturing process. FiberAid® prebiotic is certified Kosher and GRAS affirmed for foods and dietary supplements without limitations

Lonza is a leading manufacturer of L-Carnitine, sold under the brand name Carnipure™. Due to a unique manufacturing process, Lonza offers 100% pure L-Carnitine. Carnipure™ crystalline and Carnipure™ tartrate (US Patent 5,073,376) are GRAS for use in certain conventional foods as a dietary source of L-Carnitine. This vitamin-like substance enables the generation of energy from fat.

A broad range of emulsifiers and additives for food applications are produced by Lonza. We have the flexibility to meet emerging customer needs including offering Kosher, non-GMO emulsifiers, unique custom reactions and specialty lipid products.

Lonza is also the leading producer of niacin and niacinamide for food fortification, animal feed, multivitamin supplementation and pharmaceutical applications.

For further information, contact:
Lonza Inc.
Thomas Brancato
NAFTA Head of Sales & Marketing, Nutrition
90 Boroline Road
Allendale, NJ 07401
Phone: 201-316-9304
Fax: 201-785-1364
Email: tom.brancato@lonza.com
www.lonza.com
www.carnipure.com

Lonza

LycoRed Corp.

Innovative Skin Health Beverages from LycoRed
LycoRed Corp. will showcase nutricosmetic dietary supplement and beverage formulations at Supply Side West, in Las Vegas. Already a major player in the European nutricosmetics market with Lyc-O-Mato® tomato lycopene complex featured in several innovative dietary supplements for the skin, LycoRed now brings to market two platforms for carotenoid fortified nutricosmetic beverages. Savory "Tomato on the Go" and fruity "Summer Delight" are fortified with LycoRed's BLT, a premix of natural Beta-carotene, Lutein and Tomato lycopene complex. BLT is an all-natural, cold water dispersible, ready-to-use formulation.

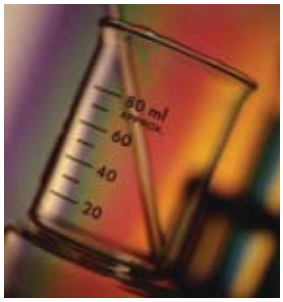
Carotenoids are a natural for nutricosmetic supplements and fortified beverages because they offer both beauty and sun care benefits. According to current research, the antioxidant activity of orally ingested carotenoids which accumulate in the skin enhances natural protection against environmental stress, reduces free-radicals which can lead to pre-mature aging, helps maintain skin firmness and elasticity and maximizes sun protection in combination with a topical sunscreen.

Visit us at Booth no. 18013

For further information, contact:
LycoRed Corp.
William Redwood
Director of Sales
Tel: 201-247-5875
Fax 973-882-0323
Email: info@us.lycored.com
Website: www.lycored.com

LYCORED

McClancy Seasoning Company



For more than 60 years, McClancy Seasoning, a fully integrated flavor and food development company, has been working to develop creative culinary solutions that streamline operations.

From creating innovative seasoning solutions, to working directly with concept formation, McClancy's research and development professionals design flavors and items that drive repeat business. McClancy Seasoning brings an extensive product line, while customizing to the flavor and preparation size that fits their clients, not one-size-fits-all.

Custom blending and packaging capabilities are available from 1 gram to 2,000-pound tote bags for industrial applications so you can enjoy consistent production and right-on-time delivery.

McClancy offers exceptional R&D support for your product development, manufacturing operations and brand strategy.

R&D Categories
- New product development
- Line extensions
- Product enhancement
- Processing improvement
- Processing characteristic enhancement
- Shelf-life enhancement
- Co-packing opportunities

Our flavor engineers solve problems and create new opportunities for our valued clients every day. We work with you to create exciting and distinctive new flavors – and make sure those flavors can be reproduced efficiently and consistently every time.

For further information, contact:
McClancy Seasoning Co.
1 Spice Road
Fort Mill, SC 29715
800.843.1968 (phone)
803.548.2379 (fax)
www.mcclancy.com

McClancy Seasoning Co.
So much more than just seasonings.

Moody Dunbar, Inc.

For 75 years Moody Dunbar, Inc. has been driven by the principles of safety, quality and dependability. This family-owned and operated business is America's largest processor of bell peppers, pimientos and roasted peppers. Dunbar ingredients are found in hundreds of products of America's largest food companies.

With proprietary seed stocks and acreage contracted only for processing, our bell peppers and pimientos are consistently superior in color, texture and flavor. Our roasted peppers are produced with a live flame-roasting process that yields a unique and unmatched flavor. Our products are produced in a wide variety of styles and cuts including diced, strips and purees. Packages include sizes ranging from 15 oz. cans to 55-gallon drums.

Our products are processes in state-of-the-art facilities and all are grown and processed in the United States. Our facilities are regularly inspected by various governmental and third party auditors. We regularly score "Superior" on these audits. We have in place a fully audited "Sustainable Agriculture" program.

Peppers, pimientos and roasted peppers are an ideal way to upscale a wide variety of foods such as soups, meats, dips, salsas, frozen entrees and refrigerated salads. Set your creations apart from your competitors by choosing Moody Dunbar, Inc. products.

For further information, contact:
Moody Dunbar, Inc.
Ed Simerly – V.P. Sales & Marketing
P.O. Box 6048
Johnson City, TN 37602-6048
Tele: 800-251-8202
E-Mail: esimerly@moodydunbar.com
Web: www.moodydunbar.com

National Starch Food Innovation

National Starch Food Innovation has the experience, the expertise and the resources to develop application-specific answers for consumer food products. Our expertise covers core attributes, like starch technology, processing tolerance, shelf life and rheology optimization and also today's most pressing issues like flavor, texture modification, mouthfeel, natural and organic formulations and nutrition content.

Texture Innovation: Through consumer and customer researcher, we've learned that "Texture changes everything" when it comes to introducing new products. Our experience, science base and sensory skills can help food formulators determine the right combination of ingredients to deliver specific textures that consumers crave and also help them achieve differentiation in their offerings. And our new Center for Texture Excellence will enable processors to develop and bring to market more exciting textures at a faster pace. Example: new N-DULGE™ co-texturizers for dairy products.

Wholesome Foods: National Starch Food Innovation is driving the development of new technology and ingredients that support the trend towards more natural, wholesome food products that, at the same time, deliver home-made or culinary experiences consumers expect. Examples: NOVATION® organic functional native starches; HOMECRAFT® functional flours.

Nutrition and Wellness: One of our goals at National Starch Food Innovation is to develop and commercialize ingredients that deliver health benefits, like those from fiber enrichment and whole grains, through traditional foods and beverages to help consumers' improve the nutritional content of their diets. Our most recent examples: Hi-maize® whole grain corn flour; NUTRIOSE® soluble fiber.

For further information, contact:
National Starch Food Innovation
10 Finderne Avenue
Bridgewater, NJ 08807
1-800-797-4992
www.foodinnovation.com

National Starch FOOD INNOVATION

Newly Weds® Foods

All the Ingredients of a World Leader.

In the food processing and foodservice industries, Newly Weds® Foods is recognized as a premier global source for Customized Taste Technology. Whether you're developing products for retail or foodservice, you'll find our resources are one of a kind.

At Newly Weds® Foods, we use FlavorTrak℠, the most comprehensive menu-tracking database in the world, helping our customers stay on top of and ahead of emerging trends.

A classically trained Culinary Staff is another ingredient in the signature formulations Newly Weds® Foods creates. "Gold Standard" signature recipes set the benchmark for our Food Technologists, a group of formulation professionals uniquely skilled in food science.

You can count on Newly Weds® Foods' Technical Service Experts to be at your site for startups, technical assistance, troubleshooting or plant audits. Plus, we will conduct personalized seminars regarding our products and associated processes, free of charge, at your location or ours.

With 16 state-of-the-art plants and 12 regional laboratories, Newly Weds® Foods has the global reach to address any processors or foodservice operation's needs. Whether you need custom formulated seasonings, capsicums, marinades or breadings and batters, the food industry's #1 source for food coating solutions is Newly Weds® Foods.

For further information, contact:
http://www.newlywedsfoods.com
or call 1-800-621-7521.

NEWLY WEDS FOODS
CUSTOMIZED TASTE TECHNOLOGY
1-800-621-7521

Ocean Nutrition Canada Limited

Ocean Nutrition Canada Limited (ONC) is an innovator and leading supplier of MEG-3®, the finest quality Omega-3 EPA/DHA ingredients from fish oil, to the global dietary supplement and healthy food markets.

MEG-3® fish oils are exhaustively tested and conform to global quality and purity standards, including those established by the European Commission (EC), Norwegian Food Safety Authority (NFSA), Health Canada, and the United States Food and Drug Administration (FDA). MEG-3® oils have set global quality standards and are the first and only fish oils to achieve U.S. Pharmacopeia verification.

The company manufactures products to cGMP (current Good Manufacturing Practices) standards in government certified facilities. Ocean Nutrition Canada is the world's largest supplier of Omega-3 fish oil concentrates, resulting in unmatched cost advantage and reliability of supply.

The MEG-3® healthy food ingredient is manufactured using ONC's exclusive Powder-loc™ technology. Powder-loc™ utilizes patented double shell protection, producing a free flowing, dry powder with a unique molecular construction that locks in the health benefits of Omega-3 and locks out even the slightest hint of fishiness. MEG-3® is the only food ingredient to deliver all the health benefits of Omega-3 with absolutely zero impact on the taste, the smell, or the texture of the food product.

For further information, contact:
Ocean Nutrition Canada Limited
101 Research Drive
Dartmouth, NS
B2Y 4T6 Canada
Tel: 902-480-3200
Fax: 902-480-3199
Email: info@ocean-nutrition.com
Website: www.ocean-nutrition.com

OCEAN NUTRITION CANADA
wellness through innovation

MEG-3®
trust the source®

Ocean Spray ITG

Ocean Spray's Ingredient Technology Group (ITG) is part of Ocean Spray Cranberries Inc, a $1.5 billion (approximate gross sales) grower-owned cooperative comprising 930 cranberry and citrus growers across America and Canada. Founded in 1930, the group satisfies 70% of the global demand for cranberries from its headquarters in Massachusetts and various North American production locations.

The cranberry is recognized for its appealing bright red appearance, tangy taste and versatility, as well as its association with a growing number of health benefits. The phenomenal success of the cranberry can be attributed to Ocean Spray's dedication to helping manufacturers develop creative and highly appealing new product lines. Fifty years of research and experimentation have culminated in unparalleled knowledge and experience in new product development – from recipe formulation to market and ingredient analysis.

Ocean Spray's patented technologies have been used to create an extensive portfolio of fruit ingredients, which are available all year round for the bakery, confectionery, dairy, cereal, snack and nutraceutical industries:

- Sweetened dried cranberries
- BerryFusions™ Fruits
- Frozen cranberries
- Cranberry concentrates
- Fruit purées
- Fruit powders and extracts

INGREDIENT Ocean Spray TECHNOLOGY GROUP

For further information on how cranberries can be used in your products, please contact: Tom Jones, Tel: (508) 946 7606 Fax: (508) 946 4594, Email: tjones@oceanspray.com
Or visit: www.oceansprayitg.com and www.oceanspray.com

ORAFTI Active Food Ingredients

Booth Number 15006

Orafti Active Food Ingredients, the world's leading supplier of prebiotics, will be highlighting the importance of prebiotic nutrition on digestive health and overall wellness. ORAFTI's prebiotics are marketed under the brand name of Beneo™ (inulin and oligofructose). These promote natural balance and support a variety of prebiotic wellness claims from bone health to immunity and good digestive function. Beneo™ is used in low fat, reduced sugar and low calorie food, beverage and nutraceutical formulations without affecting taste or texture. Delivery systems featuring prebiotics will include supplements, nutrition bars, meal replacement bars and beverage applications to name just a few.

For further information, contact:
Joseph O'Neill
Executive Vice President Sales and Marketing
Orafti North America
973-867-2140

ORAFTI
ACTIVE FOOD INGREDIENTS

P. L. Thomas

P. L. Thomas
Where Food and Health Meet
SupplySide West - Booth 20025

PLT highlights exciting new products for food/functional foods applications at SupplySide West 2007:

Kaneka Q10™ the only self-affirmed GRAS Coenzyme Q10 and the only Q10 made through a natural yeast fermentation process.

Tomat-O-Red® natural red color made with lycopene.

PomegranateP40*p*™ rich with 40% punicosides and Kosher certified.

Phosphatidylserine (PS), self-affirmed GRAS (FDA no questions). PS is recognized by theFDA for improved cognitive health.

MenaQ7™ — Natural Vitamin K2 for healthy heart and bones

P.L. Thomas, a New Jersey based ingredient supplier, offers more than fifty years of innovation in securing reliable, high quality raw materials for the food/functional food and nutrition industries. PLT specializes in water-soluble gums and clinically-supported botanical extracts. They are a one-stop resource for application ideas, current industry information and technical service.

For further information, contact:
P.L. Thomas
Morristown, New Jersey
Paula Nürnberger
plt@plthomas.com
973-984-0900
www.plthomas.com

plt p.l. thomas

Where Food and Health meet...

Pharmachem Laboratories, Inc.

Pharmachem Laboratories, Inc., is a family of companies specializing in manufacturing and value-added processing of custom ingredient systems for food, beverage, flavor, fragrance and dietary supplement customers since 1978. We are NOP Certified Organic since 2002.

We have 10 manufacturing facilities in the USA offering vertically integrated enzymatic, thermal and mechanical processing technologies, from benchtop to commercialization.

Core processing capabilities include; encapsulation, extraction, concentration, purification and recovery, distillation, clarification, granulation, agglomeration, microparticulation, spray drying, spray-chilling, fermentation, heavy-duty blending, wet and dry blending and more.

We offer soluble premixes, claim-specific fortifications, concentrated dairy flavors, and application-specific solutions.

Whether it is a healthy ingredient system, a standardized plant extract, a concentrated dairy flavor or a process problem you just can't figure out, Pharmachem has the technology and talent to help you succeed in the food & beverage marketplace.

We have been over 30 years experience with health & wellness solutions.

We make ingredients work™.

For further information, contact:
Pharmachem Laboratories, Inc.
201-719-7405 | 800-526-0609
food@pharmachemlabs.com
www.pharmachemlabs.com

"We Make Ingredients Work"™

PURAC America

In your search for natural ingredients turn to PURAC America, a leading food ingredient company that specializes in the highest quality natural lactic acid, lactates and gluconates. PURAC's expertise in the food industry allows processors to utilize our highly skilled technical team to help strategically navigate successful new product introductions in the food and beverage industries. Food processors rely on PURAC to bring new ideas to their attention and to provide quality ingredients and stellar customer service. PURAC is focused on reducing your product development cycle to allow increased speed to market while decreasing your costs.

To help our customers utilize their time and resources more efficiently, PURAC introduces the "Creative Kitchen", a new food application center in Lincolnshire, IL. Designed to assist customers with innovation and the creative process during product development, the "Creative Kitchen" combines a passion for excellence with the technical expertise and in-depth knowledge of application essentials to help our customers.

PURAC strives to continuously improve our customer satisfaction and to be the SOURCE YOU CAN DEPEND ON.

PURAC Ingredients Key Functions:
- Acidulant
- pH Regulation
- Shelf Life Extension
- Improved Food Safety
- Pathogen Control
- Flavor Enhancement
- Full Line of Mineral Enrichment

For further information, contact:
Eva Dratwa
Marketing Services
111 Barclay Boulevard
Lincolnshire Corporate Center
Lincolnshire, IL 60069
847.634.6330
IFT Booth #2513
Email: pam@purac.com
www.purac.com

PURAC
THE SOURCE YOU CAN DEPEND ON

Puratos

A Flavour of Puratos
Trying to get the most out of their busy lives, enjoying and sharing delicious and healthy food, discovering new tastes and keen to experience different sensations. These are some of the characteristic traits of the ever demanding consumers that Puratos and our customers must attract and delight – constantly.

Whether it is in the arena of health, pleasure or convenience, new concepts and innovative ideas are the only means to attract and retain these consumers of today. This equates to an endless stream of challenges and opportunities for bakers, patissiers and Chocolatiers all over the world. Working alongside and in partnership with them, we at Puratos constantly develop ingredients, technologies and innovative solutions. Because their consumers want nothing but the very best... only the best will guarantee success. Ensuring that they are increasingly successful in their business defines the mission of PURATOS and guides everything that we do.

Globally and locally, innovation through R&D and consumer insights has always been the driving force in the partnerships we have established with our customers. Our research programmes always stem from consumer needs and our sensorial analysis laboratories help us better understand their preferences.

Finally, our unicorn, a symbol of ethics and courage, reminds us of our commitment to innovation, quality and reliability.

Puratos – your reliable partners in innovation.

For further information, contact:
Puratos US Corporate Headquarters
1941 Old Cuthbert Road
Cherry Hill, NJ 08034
Phone: 856-428-4300 or 800-654-0036
Fax: 856-428-2939
E-mail: infous@puratos.com
URL Website: www.puratos.us

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Puratos
Reliable partners in innovation

Sargento Food Ingredients

Marrying convenience and simplicity with great flavor, Sargento Food Ingredients has a unique way to bring sauce to your refrigerated products—Custom Melts™. Added to a meal kit or side dish, fresh tasting Custom Melts turn into sauces in minutes, making an ordinary dish, extraordinary.

Sargento Custom Melts™ are made using a patented technology that is totally customizable, so they deliver the form, flavor and functionality your application demands. With excellent cling, intense flavor and a cleaner dispensability than ready-made sauces, Custom Melts™ make saucing a dish simple. These high quality sauces come in just about any refrigerated form you can think of—shreds, dices, cubes or slices. Added to your product, Custom Melts™ turn into flavorful sauces within a few moments of heating.

A creamy and delicious addition to vegetables, side dishes or meal kits, Custom Melts™ are available in more than a dozen varieties including—Garlic-Herb, Sharp Cheddar, Alfredo, Pepper Jack, Creamy Pesto and Country Gravy.

To find out more about this revolutionary product, go to www.sargentofoodingredients.com and click on Custom Melts™ or contact:
Sargento
One Persnickety Place
Plymouth, WI 53073
800-795-7090
www.sargentofoodingredients.com

SARGENTO
Our Family's Passion is Cheese.

Taiyo International

Taiyo is a leading manufacturer of functional ingredients for the food, beverage and supplement industries. Taiyo focuses on the development of innovative ingredients, derived from natural sources, to further develop the body's ability to protect and manage one's health. Products include Suntheanine® (a unique amino acid found in green tea which reduces stress without drowsiness), Sunphenon® (high-grade green tea catechins), Matcha Powder (natural green tea leaf powder high in polyphenols, vitamins, minerals and fibers), SunActive® Fe (a superdispersed iron having no gastrointestinal irritation, no unpleasant flavor, no change of color and superior bioavailability) and Sunfiber® (a water-soluble dietary fiber).

TAIYO

For further information, contact:
Taiyo International
5960 Golden Hills Drive
Minneapolis, Minnesota 55416
Tel: (763) 398-3003
Fax: (763) 398-3007
www.TaiyoKagaku.com

Tetra Pak Inc.

Tetra Pak protects what's good™.

Tetra Pak is focused on providing food and beverage manufacturers with customized, comprehensive processing and packaging solutions, including processing and filling equipment, plant automation and a large variety of packaging systems and secondary packaging solutions. This approach allows Tetra Pak to truly be the company that "protects what's good."

For more information, visit www.tetrapakusa.com.

For further information, contact:
Tetra Pak Inc.
101 Corporate Woods Parkway, Vernon Hills, IL 60061
Phone: (847) 955-6000
Fax: 847-955-6500
Contact: Giovanna Prestes
Email: giovanna.prestes@tetrapak.com
www.tetrapakusa.com

protects what's good™ Tetra Pak

Supplier Profiles | 2007

advertorial

Tree Top, Inc.

Tree Top's mandate to its 1,700 grower-owners is to process their fruit into the highest quality, value-added products in the industry. Beyond premium apple juices, the company's ingredient group produces and sells a wide variety of bulk dried, chilled, frozen apple and frozen cherry products, as well as specialty juice concentrates. Tree Top is the world's largest supplier of dried apple products and is the primary supplier to the U.S. market, providing food ingredients to more than 20 of the nation's top 25 food companies.

Almost from the company's establishment in 1960, Tree Top has been an innovator in developing new consumer products and packaging. Frozen apple juice concentrate was developed first by Tree Top and sold under the same label. Today, the company remains dedicated to providing superior technical support capabilities. Tree Top's experienced scientists and food technologists are readily available to work with customers on the development of new products and unique applications.

Tree Top continues to develop multiple applications for its ingredients — particularly its low-moisture apples — in order to serve customers as they, in turn, strive to keep up with consumer demand for a greater variety of healthful cereals, snacks and baked goods.

For further information, contact:
Tree Top, Inc.
P.O. Box 248
220 E. Second Ave.
Selah, WA 98942-0248
Phone: 800-367-6571, Ext. 1435
Fax: 509-698-1409
www.treetop.com

TREE TOP
REAL FRUIT FROM REAL PEOPLE

Virginia Dare

America has many great regional food tastes and cuisines. Americans are looking for products that also provide them with health and wellness. Virginia Dare demonstrated how the Great Tastes of America could be incorporated into both products for health and wellness as well as indulgence. Virginia Dare offered a variety of exciting taste experiences from diverse regions of the United States under the theme "Great Tastes of America" at Supply Side West 2007. Offered for sampling, demonstrating regional tastes, were Pennsylvania Dutch Snicker Doodle Healthy Cereal Bars and New England Maple Healthy Baked Snacks. The results of a recent consumer insights survey were revealed at the booth.

Virginia Dare is a leading manufacturer of premium Vanilla, Tea, Coffee and Cocoa Extracts and Concentrates as well as a uniquely varied line of Flavors for natural, organic and health and wellness foods and beverages. Our product line also includes PROSWEET® flavors and other masking flavors for fortified and functional foods, beverages and pharmaceuticals.

For further information, contact:
Virginia Dare
Think of us as Flavor
718/788-1776
718/768-3978 fax
flavorinfo@virginiadare.com
www.virginiadare.com

VIRGINIA DARE
Think of us as Flavor

PREPARED FOODS NEW PRODUCTS CONFERENCE

October 14-17, 2007 • Naples Grande Resort, Naples, Florida Mintel

Prepared Foods' 25th annual **New Products Conference** is the food & beverage industry's premier event for gaining valuable insights into exciting global new products, culinary advances and emerging consumer trends.

The **New Products Conference** provides R&D, Marketing and Corporate Management executives like you, a dynamic forum to learn from 18 world-class speakers, capture valuable new product & trend data, participate in an interactive culinary session, taste new products from around the globe, experience a live consumer focus group, capitalize on incredible networking and rejuvenate your creativity.

Sunday, October 14, 2007

12:00 - 4:00 p.m. **Everglades Adventure**
Travel the woven waterways of 10,000 islands while solitude envelopes you. You may see the snout of a manatee or the grace of dolphins swimming, birds, plants, and marine life.
Sponsored by Innophos

12:30 p.m. **Golf Tournament**
The Naples Grande golf course has challenges to put you to the test, yet it remains forgiving enough to remind you that golf is, after all, supposed to be fun.
Sponsored by Chr. Hansen

1:00-5:00 p.m. **Pre-Conference Workshops**
The Product Development Management Association's pre-conference sessions offer attendees a highly customized, intimate, learning opportunity.

pdma product development and management association

1) The Case for Building Your Innovation Budget
Lip service to innovation ends where the budget begins. Successful innovation management depends on the steady long term funding that builds a continuous flow of new ideas for your market. Funding must be matched by an informed leadership team that is both aggressive around expectations and understanding of failure. This workshop will take a hard look at strategies that succeed and strategies that doom a company to low margin slow follower status. We will look at ways to help participants build their case for their innovation budget.
Christopher W. Miller, Ph.D., NPDP, PDMA

2) Developing New Product Concepts
Responsible for developing new product concepts to fill your innovation pipeline and not sure how to get started? This workshop is a step-by-step guide for building new product concepts from task identification and idea generation through initial screening.
Andre Csapo, Director Discovery & Innovation, PDMA

3) The Creative U
Knowledge of your own creative style and creative preference is important for top performance at work or in your life. Learning tools and techniques to enhance creativity and bring creative energy into the service of your customer is the topic of this fun and exciting exploratory workshop.
Bree Gillespie, Director, Discovery & Innovation, PDMA

7:00-9:00 p.m. **Welcome Reception**
Start this year's New Products Conference with a casual networking event. Make the connections that will enhance your conference experience.
Sponsored by Senisent Flavors and Colors

discover new products

network

new product ideas

Register today, attendance is limited to 300.
Save with the Early Bird and Team Discounts!

Register online at www.PreparedFoods.com/npc

Monday, October 15, 2007

7:30-8:30 a.m. **Breakfast Buffet**
Sponsored by Tree Top

8:30-8:45 a.m. **Opening Remarks**
Peter Havens, Group Publisher and Claudia O'Donnell, Editor-in-Chief, *Prepared Foods*

8:45-9:30 a.m. **Keynote: Convenience as Defined by the Generations: Boomer, Gen Xer and Millennial**
Speaker: Larry Wu Jr., Vice President, Consumer Strategist, Food and Beverage, Iconoculture
"Convenience" conjures up images of a speedy kitchen for consumers, but mealtime stress plays out differently for each generational consumer segment. Time is not always the primary driver, and the definition of kitchen convenience varies by age. How does this "Ready, Set, Go!" behavior differ by each generation? What is the impact on food choices, and how can these differences be applied to product development, packaging and marketing strategies? Wu's experience as R&D director with Starbucks, as well as with CH Guenther & Son, General Foods Corporation and Campbell Soup, gives him real-world experience for realistic advice.

9:30-10:00 a.m. **Understanding La Comida Latina**
NEW
Speaker: Ricardo Lopez, President, Hispanic Research Inc.
Hispanic culture revolves around food. Neighborhood selections are even based on the availability of Latino foods. This unyielding attitude affects everyone in the food industry and is changing the way America eats. However, understanding Latino food is not easy. Latinos come from some 20 different countries, each with a unique food heritage. In addition, Hispanics demand new prepared foods to go with their new American lifestyle. This presentation examines Hispanic food attitudes and addresses Latino food needs.
Sponsored by Virginia Dare

10:00-10:30 a.m. **Refreshment Break**
Sponsored by Flax Canada 2015

10:30-11:00 a.m. **Fads and Fundamental Changes, Tracking the American Consumer**
Speaker: Joe Derochowski, Director, NPD Group
Dining out or dining in. Snacking or sit-down meals? What do Americans think and do? Utilizing research from 30 proprietary databases and 31 years of trend tracking, a revealing look explores what, where, when and how Americans eat. Year-to-year changes in eating habits can be small but surprising, while significant changes emerge over time.

11:00-12:00 noon **Exploring Tumultuous Teens**
Live Focus Group
Facilitators: Bryan Urbick, CEO & Chairman, and Abel Westerhof, COO & Director – Consumer Knowledge Centre Ltd
Targeting the critical teen market is a challenge for food manufacturers. Many companies are resigned to lose consumers during these years in the hope that teens will again be brand loyal during adulthood. Mintel has called teens the "ignored demographic." Learn from a live teen panel discussing food and beverages in the context of their lives, what is important to them and what is not. Hear their views on shopping for food, eating in versus out, choosing brands and products, product winners and losers, and, most importantly, their reasons why. Audience participation is encouraged in an extended Q&A session.
Sponsored by IFF

12:00-1:30 p.m. **Luncheon**
Sponsored by California Raisin Board

1:45-2:30 p.m. **Obesity: A Defining Issue in Health and Wellness**
Speaker: Barb Stuckey, Executive VP of Marketing, Mattson
New products ideally address all consumer desires, from indulgence to healthy eating. With the current "obesity crisis," how can this be accomplished ethically, yet profitably? What marketing and product development tactics assist food manufacturers in finding overlooked opportunities? Primary research is unveiled providing insights on new concepts offering consumers hope, encouragement and help in weight and overall health management.

"Fascinating, I liked seeing and hearing a live panel"

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To register, contact Jenny Bogdajewicz at 630-694-4353, Bogdajewiczj@bnpmedia.com or www.PreparedFoods.com/npc

OCTOBER 14-17, 2007 Naples Grand Resort, Naples, Florida

2:30-3:00 p.m. **Refreshment Break**
Sponsored by Flax Canada 2015

3:00-3:40 p.m. **Delving into Demographics**
Speakers: Lynn Dornblaser and David Jago, Directors, GNPD Consulting Services
Consumers want what they want, but what do food manufacturers think they want? This fast-paced presentation discusses new products around the globe that are being positioned for specific demographics. What intriguing new products are for children, for women, for consumers concerned about heart health or digestive health, for those looking for familiar indulgence or searching for novel, creative new foods and beverages? Insights and information will light the creative spark in R&D and marketers alike.

3:40-5:00 p.m. **Global Product Sampling: Delivering to Consumer Niches**
Presented by: The consulting staff of the Mintel Global New Products Database (GNPD)
Sometimes listening is not enough. Tasting, touching and seeing firsthand some 70 new products launched around the world provides invaluable, impossible-to-get information. Products will be grouped by key consumer niches.

6:00-7:00 p.m. **Cocktail Reception**
Sponsored by Hormel Foods Corp.

7:00-7:30 p.m. **The Spirit of Innovation Awards Ceremony**
Join us in celebrating the industry-nominated, innovative product development teams that recently introduced a new product in foodservice and retail markets. Discover how these product development teams operate.
Sponsored by Ventura Foods

7:30-9:00 p.m. **Spirit of Innovation Dinner**
Join us for a casual buffet featuring Floridian cuisine. Relax and enjoy great food and conversation. Share your thoughts on today's sessions. Immediately following the Awards Ceremony.
Sponsored by Ventura Foods

"Excellent speakers, very interesting presentations"

"Better understanding of worldwide trends in foods and flavors"

Tuesday, October 16, 2007

7:30-8:30 a.m. **Breakfast Buffet**
Sponsored by Ocean Nutrition Canada

8:30-9:15 a.m. **Positioning "Healthy" Products for Success**
Speaker: Valerie Skala Walker, Vice President, Consumer & Shopper Insights, Information Resources, Inc.
As more prepared food products incorporate health-related benefits, it is increasingly important to understand the factors that help or hinder their success. What are some of the most successful new brands with health-related positions in the marketplace, and what are the factors contributing to that success? From the words used to describe a product's features and benefits to the dollars spent on advertising, what makes one brand outsell its rivals?

9:15-10:00 a.m. **Exploring Tumultuous Teens: Insights and Take Aways**
Speaker: Bryan Urbick, CEO & Chairman, Consumer Knowledge Centre Ltd
As a follow-up to Monday's thought-provoking panel of teens, additional insight and analysis will provide the audience a better understanding of this important and mystifying consumer segment.
Sponsored by IFF

10:00-10:30 a.m. **Refreshment Break**
Sponsored by Qualisoy

10:30-11:00 a.m. **Food and Flavor Trends Through Foodservice Operators' Eyes**
NEW
Speaker: Kevin Higar, Director Operator Product Development, Technomic
The foodservice industry is both a vital customer segment of packaged foods companies and also a source of inspiration for new product ideas. What are current and emerging food developments in this arena? What culinary trends, flavor profiles and emerging concepts are operators utilizing to satisfy loyal customers and attract new ones? What strategic consumer trends drive the menu items of today and tomorrow? Most importantly, how do prepared food suppliers help operators succeed in this dynamic environment?

2007 SPONSORS

Innophos · OmegaPure Healthy Products for a Healthy World™ · MANE · Look Who's Cooking With California Raisins · Ocean Nutrition Canada wellness through innovation · Takasago · Roxlor International · National Starch Food Innovation · Seltzer Nutritional Technologies · Virginia Dare Think of us as Flavor

Why go alone? Bring a colleague and save with the team discount!

11:00-11:35 a.m. **If it Tastes Good, is it Bad?**
Speaker: Dr. Gary Beauchamp, Director, Monell Chemical Senses Center
Foods or beverages will not be consumed unless they taste good. Yet it sometimes seems as if most of what tastes good is actually bad for us--especially sugar, salt and fat. Also, what is good for us often is not so well liked, such as vegetables. These generalizations are particularly pertinent when considering children. This presentation discusses why we like and dislike what we do, how these preferences might be modified, and why recent discoveries in how our flavor sensory systems work may provide new approaches to healthy enhancement of food flavors.

11:35-12:00 noon **Collegiate Education Awards**

12:00-1:00 p.m. **Luncheon**
From Culinary Inspiration to New Product Innovation
A multi-sensory exploration of the leading-edge culinary trends today that are shaping the way we experience food tomorrow.
Sponsored by Givaudan

1:15-3:45 p.m. **Innovation Panel**
Innovation has been defined as the successful implementation of creative ideas within an organization. Through innovation, companies lift their products above commodity status to provide more profitable foods and beverages desired by consumers. What does it mean to be innovative? What are pitfalls to avoid? Which tools and opportunities can be leveraged? This accomplished panel will offer perceptive suggestions.

1:15-1:45 p.m. **Panelist 1: Lynn Gordon, President, French Meadow Bakery & Cafe**
French Meadow Bakery has nationally introduced cutting-edge, healthful and even controversial products such as Men's Bread, Healthy Hemp Bagels and Fat Flush Sprouted Tortillas. Founded in 1985, French Meadow is the longest continuously certified organic bakery in the country and has been twice named by *Bon Appetit* magazine as one of the Ten Best bread bakeries in the U.S. With an unorthodox approach, business success has followed, with Gordon being named Minnesota's Small Business Person of the Year in 2005 by the Minnesota district office of the U.S. Small Business Administration.

1:45-2:15 p.m. **Panelist 2: Jeff Bellairs, Director of the Worldwide Innovation Network, General Mills**
General Mills is building relationships with external partners that are enhancing, complementing, and accelerating innovation already taking place internally. Coined "Open Innovation", this initiative is helping the company evolve and expand its innovation efforts. General Mills has found that by leveraging new products and technologies created outside the company, it is better prepared to meet the changing demands of the marketplace.

2:15-2:45 p.m. **Refreshment Break**
Sponsored by Wild Flavors

2:45-3:15 p.m. **Panelist 3: Phil Roos, President & CEO, Arbor Strategy Group**
What are the key drivers of winning innovation, and how can organizations leverage them to drive sustainable growth? Creativity, consumer insights and rigorous business analysis all play a central role, but a deeper understanding of innovation itself is also critical. The Arbor Strategy Group's work has uncovered a simple yet powerful truth: innovation is evolutionary and tends to follow a fairly predictable pattern. Understanding these patterns and the "innovation evolution model" can help organizations identify high-potential, future opportunity space and translate it into innovation that is differentiating and creates real value.

3:15-3:45 p.m. **Innovation Panel Q&A Session**

6:00-7:30 p.m. **Networking Reception**
Relax, unwind and enjoy mouth watering appetizers and thirst-quenching libations.
Sponsored by National Starch Food Innovation

7:30 p.m. **Dinner on your own.**

Wednesday, October 17, 2007

7:30-8:30 a.m. **Breakfast Buffet**
Sponsored by Mane, Inc.

8:30-10:00 a.m. **Differentiating Products with Innovative Flavor Combinations**
Interactive Tasting Session
Speakers and Facilitators: Dr. Victor A.L. Gielisse, CMC, Associate Vice President, and Ronald De Santis, Director, Continuing Education's Industry Solution Group, The Culinary Institute of America
Consumers demand variety, stimulation, authenticity and satisfaction from foods and beverages. This interactive session will demonstrate the use of ordinary ingredients to bring extraordinary results by creating flavors that entice consumers. Two great culinary educators exhibit their skills and enlighten New Product Conference attendees by providing irreplaceable knowledge through the experience of tasteful samples.

10:00-10:30 a.m. **Closing: Thank you from New Products Conference Organizers**
Grand prize drawing and more!
You could win roundtrip airfare for 2 anywhere in the US! That's not all, you'll have a chance to win other prizes too. Don't miss Mintel's Global New Products to take home.

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Supplier **Literature**

Now available from the American Egg Board is the new "incredible" egg CD titled *American Egg Board Egg Product Information Resource*. This CD is filled with scientific-based technical information, complete with summaries of egg product research, nutritional information, reference data, and much, much more. The information details how incredible egg products help meet today's formulation challenges including gluten free, trans fat free, satiety and as an energy booster.

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Newtrition™ gives your products a healthy competitive edge.

Newtrition from Cognis® offers naturally-sourced ingredients for innovative, effective and safe health-enhancing products. Cognis Nutrition & Health is a leading global supplier of plant sterols & sterol esters, lutein esters, conjugated linoleic acid (CLA), and Omega-3 fatty acids. Trust Cognis to deliver the nutritional ingredients you need to meet consumer demands for healthy and convenient foods.

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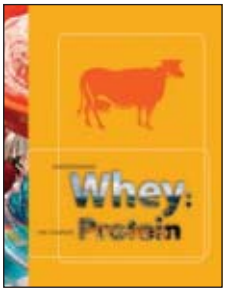
Ingredients for the Food Industry

Grain Processing Corporation's line of specialty carbohydrates continues to expand to meet the changing requirements of our customers. Pure food starches include PURE-COTE® and INSTANT PURE-COTE® binding/coating starches, INSCOSITY® cold water swelling modified starches, PURE-DENT® PFP and specialty starches, PURE-SET® thin-boiling starches and PURE-GEL® stabilized starches. Also available are MALTRIN® and MALTRIN QD® maltodextrins and corn syrup solids and TruBran® corn bran.

GPC is committed to finding effective solutions for any problem - large or small.

Grain Processing Corporation
1600 Oregon Street, Muscatine, Iowa 52761
Phone: 563-264-4265, Fax: 563-264-4289
E-mail: sales@grainprocessing.com



Hilmar Ingredients is dedicated to helping our customers and industry partners understand the value of our products, and their benefits to consumers. Understanding Whey: The Complete Protein has been developed as a reference tool to provide key information on the nutritional and functional contributions of whey protein.

Hilmar Ingredients
888.300.4465
www.hilmaringredients.com

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How do you generate interest in your company?

In the *Prepared Foods* Literature Review section!
Contact Christin Schrei
@ (231) 487-0400
or schreic@bnpmedia.com
for more information.

Supplier Literature

International Dehydrated Foods, Inc.
IDF™ is a world leader in the development, processing, and distribution of natural meat and poultry-based food ingredients that include spray-dried meat and poultry powders, chicken fat powders, broth powders, 32% (37 Brix) frozen chicken broth, and shelf-stable liquid chicken fat.

Customer Service
International Dehydrated Foods, Inc.
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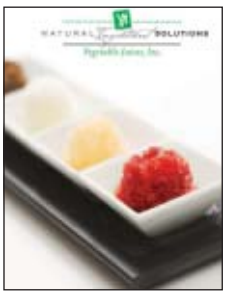

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STAFF

Peter Havens Group Publisher
Tel: 630-694-4345 • Fax: 248-502-1011
havensp@bnpmedia.com

DIRECTOR OF BUSINESS DEVELOPMENT
Michael Leonard
Tel: 630-694-4024 • Fax: 248-283-6574
leonardm@bnpmedia.com

EAST COAST & EUROPE
Ray Ginsberg Senior Account Manager
PO Box 878, Mt. Laurel, NJ 08054
Tel: 856-802-1343 • Fax: 248-502-1043
ginsbergr@bnpmedia.com

MIDWEST & SOUTHEAST
Greg Szatko Senior Account Manager
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Bensenville, IL 60106
Tel: 630-694-4337 • Fax: 248-502-1032
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WEST COAST & SOUTHWEST
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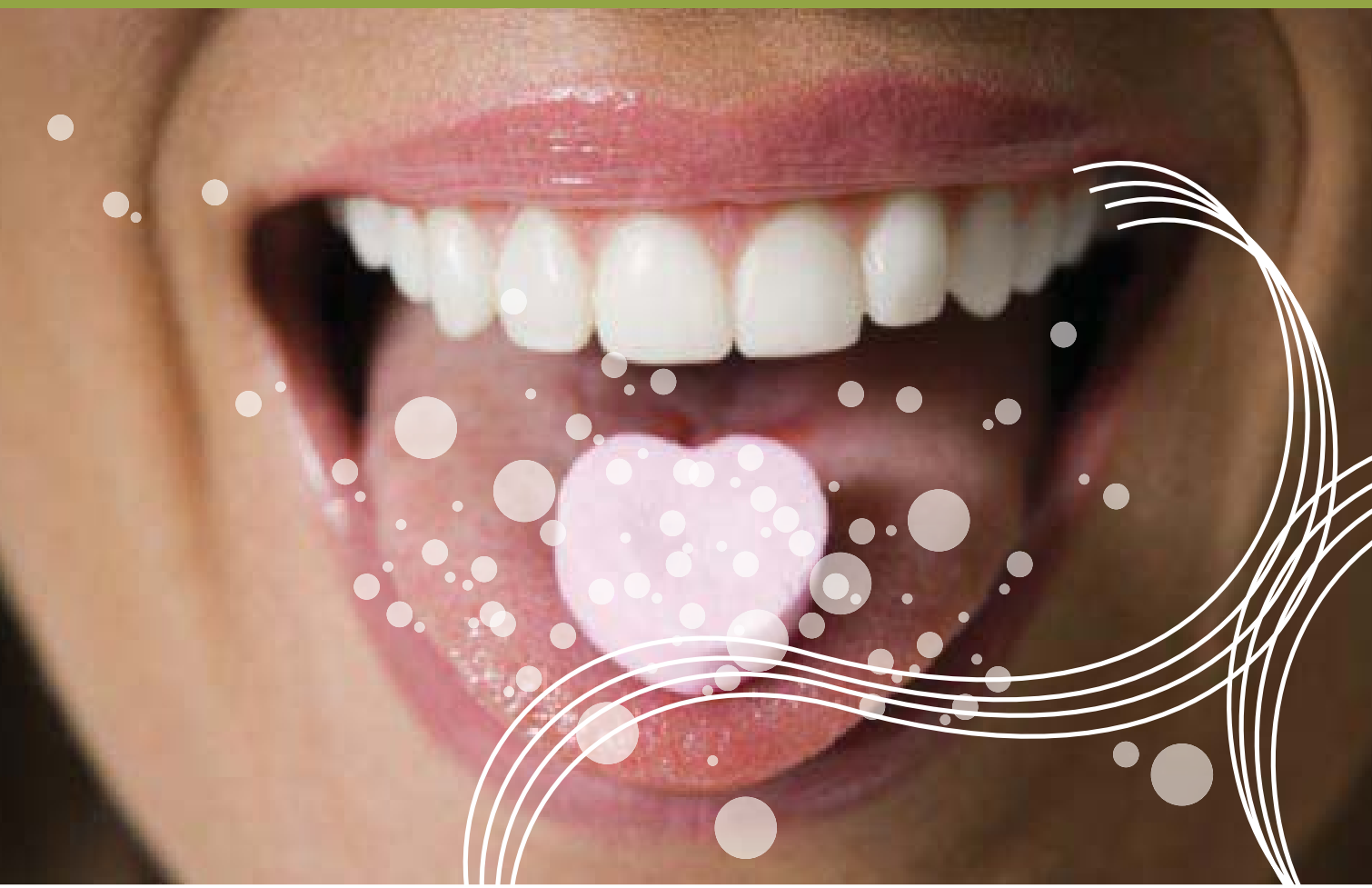

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